The Impact of Higher Wages on Public Transfers

Introduction

Millions of working Americans and their families rely upon income from public assistance programs to afford their basic needs. As participation in these programs swelled in the Great Recession and its aftermath, there has been growing concern that some of these programs, meant to serve as temporary protections from undue material hardship, have become semi-permanent supplements to labor income that is insufficient to meet basic costs of living, even for full-time workers. Recent calls to raise the federal minimum wage have highlighted this issue, arguing that the inadequacy of the current national wage floor allows—if not encourages—employers to use public assistance programs to meet some of their labor costs.

As policymakers consider means of lifting wages among low-wage workers, such as raising the minimum wage, it is important to better understand how such policy changes might affect public assistance and transfer program utilization. The income restrictions on most programs would suggest an unambiguous decline in participation and program costs. Yet because the Earned Income Tax Credit (EITC) is designed as an increasing wage subsidy up to a set threshold, it is not clear at first glance that raising the wage income of low-income would necessarily lead to a net reduction in overall transfer spending.

This paper examines the utilization of public assistance among low-wage working individuals and their families. It looks specifically at participation in Medicaid and the six primary means-tested income-support programs: the Earned Income Tax Credit (EITC); the Supplemental Nutrition Assistance Program (SNAP), also known as food stamps; the Low Income Home Energy Assistance Program (LIHEAP); the Supplemental Nutrition Program for Women, Infants, and Children (WIC); the Section 8 Housing Choice Voucher Program; and the Temporary Assistance for Needy Families program (TANF) or equivalent state and/or local cash assistance programs.

Key findings include:

- Half of all working recipients of public assistance work full time, defined as at least 1,990 hours per year.
- More than half (54.2 percent) of all workers in the bottom decile of wage-earners receive income from public assistance programs, either directly or through a family member. Just less than half (45.1 percent) of workers in the second decile of wage-earners also receive public assistance benefits.
- Increasing wages for low-wage workers would unambiguously reduce net spending on public assistance, particularly among workers in the range likely to be affected by a federal minimum wage increase.
- Raising the federal minimum wage to $10.10 per hour would decrease the number of workers receiving public assistance by an estimated 1.4 million workers, saving safety net programs more than $5.4 billion annually. Both of these estimates are likely too conservative as they are not adjusted for the known underreporting of transfer income in the data.

The layout of the paper is as follows: After a brief review of similar previous research, I discuss the data sources and methodologies used in this study, and then present summary statistics on program participation and transfer income receipt by working individuals' annual hours of work, hourly wage level, and major industry of employment. Using a series of linear regressions, I then examine how higher wages among these workers affects utilization rates and benefit dollars received. Finally, I use a microsimulation approach to estimate the effect that the federal minimum wage to $10.10—as proposed in the Fair Minimum Wage Act of 2014—would have on program participation rates and aggregate program spending.

Background and previous literature

There is relatively little research into how increases in hourly wages among low-wage workers, typically through increases in statutory wage floors, affect government spending and participation in public assistance programs. While the minimum wage is one of the most studied topics in economics, most of this research has focused primarily on how wage floor policies affect employment – see Kuehn (2014) or Schmitt (2013) for a summary. In recent years, some researchers have looked more closely at how increases in the minimum wage have affected family incomes and poverty rates. Dube (2013) provides an extensive survey of this literature and conducts his own analysis of Current Population Survey data. Consistent with most past research, he finds that increases in the minimum wage significantly reduce poverty rates and increase family incomes, particularly for low-income families.

More recently, the Congressional Budget Office (2014) examined the potential effects of a federal minimum wage increase to $10.10. While there is some debate over their predicted effects on employment—see Schmitt (2014) or Shierholz and Cooper (2014)—CBO estimated that an increase in the federal minimum wage to $10.10 would increase family incomes of workers below the federal poverty line by $5 billion and lift incomes of workers between one and three times the poverty line by $12 billion. They predict that such an increase would lift 900,000 people above the federal poverty line.

CBO notes that these increased earnings would result in higher tax revenue and reduced spending on certain means-tested federal assistance programs, although they do not go into detail on the predicted effects upon individual programs. They also predict that the government would face some additional direct costs from increased wages to a small number of government employees, and possibly a small increase in purchasing costs of certain goods and services if prices were raised by producers in response to the wage hike. In the short-term, CBO predicts that federal expenses would go down, but then could go up later on if the increase has any negative effect on employment. On net, they conclude that "it is unclear whether the effect for the coming decade as a whole would be a small increase or a small decrease in budget deficits."[i]

Yet other researchers have attempted to quantify the potential savings to government transfer programs from federal minimum wage increases in the past. Giannarelli, Morthon, and Wheaton (2007)

used a microsimulation model of all U.S. tax, transfer, and health programs to estimate the effects of package of labor and anti-poverty policies, including raising the federal minimum wage to from $5.15—its level in 2007—to $7.25. They estimated that such an increase would decrease transfer costs or raise federal revenues by over $2 billion (roughly $2.5 billion in 2013 dollars.) They also simulated raising the minimum wage to half the average wage of production, nonsupervisory employees—at that time, equal to $8.40—and estimated it would reduce transfer costs or raise revenues by $12 billion ($15.2 billion in 2013 dollars.)

Other researchers have looked at how low wages and the minimum wage interact with utilization of specific transfer programs or utilization in particular states or industries. West and Reich (2014) look specifically at the effect of past minimum wage increases on SNAP enrollments and expenditures. They use a regression framework exploiting state variation in minimum wage levels over a twelve-year period from 1990 to 2012. They find that "a 10 percent increase in the minimum wage reduces SNAP enrollment by between 2.4 and 3.2 percent and reduces program expenditures by 1.9 percent." Based on these findings, they conclude that an increase in the federal minimum wage to $10.10 would reduce SNAP enrollments by up to 3.8 million persons, and decrease program expenditures by nearly $4.6 billion. Because both the proposed minimum wage level and the SNAP eligibility level are both indexed for inflation to the CPI, this savings would total $46 billion over the 10-year budget window.

Allegretto, et. al (2013) looked specifically at receipt of public assistance among workers in the fast food industry. They found high rates of take-up among front-line fast food workers, with more than half of the families of such workers utilizing public assistance, compared with 25 percent of the workforce as a whole. While the authors do not attempt to simulate any effect on assistance payments from raising wages in the industry, they estimate that taxpayers spend $7 billion dollars annually in public assistance programs for families of these workers.

Finally, Zabin, Dube, and Jacobs (2004) examined utilization of California's 10 major means-tested public assistance programs among working families. They found that more than half of the state's spending on public assistance goes to "working families," defined as families where at least one family member worked at least 45 weeks out of the year. Using a microsimulation approach, they estimated that if the state raised its minimum wage from $6.75, where it stood at that time, to $8 per hour, the state would save $2.7 billion ($3.3 billion in 2013 dollars.)

Methods and data

For the first part of this study, I use data from the Current Population Survey, Annual Social and Economic Supplement (CPS-ASEC). The CPS is the monthly survey used by the Census Bureau to track a variety of labor market indicators, including the unemployment rate. The ASEC is a set of additional questions asked of CPS respondents each March about their economic status in the preceding year. It is used to calculate the government's official measures of family incomes, assess sources of income, and determine poverty rates.

In addition to the ASEC data, I also incorporate data from the Census Bureau's Supplemental Poverty Measure (SPM) public-use research files. The SPM is an alternative poverty measure developed by the Census Bureau that takes a more holistic appraisal of both family income sources and family expenses. In addition to the rich sources of income data already within the CPS-ASEC files, the SPM data adds information on several other means-tested public assistance programs, such as income from the Earned Income Tax Credit (EITC), the Low-Income Home Energy Assistance Program (LIHEAP), and the Supplementary Nutrition Program for Women, Infants, and Children (WIC).

While the CPS-ASEC and SPM data provide excellent information on annual incomes—including income from wages—the survey's focus on *annual* income creates challenges for assessing how increases to *hourly* wages might affect public assistance levels. Low annual incomes could be the result of low hourly wages, inadequate annual hours of work, or some combination of the two. While a thorough examination of these influences is beyond the scope of this paper, I do discuss this issue to a limited extent in the next section and in Appendix A.

The hourly wage information used here is developed as follows: The survey asks respondents to describe their annual income and sources of income over the preceding year. Respondents are also asked to report the number of weeks they worked during that year, and the usual number of hours they worked in the weeks that they worked. With these three pieces of information, one can impute each individual's implied hourly wage for the time they were working.

Admittedly, these implied hourly wages from the ASEC data are less robust than other sources of hourly wage information, such as the wage data in the Current Population Survey's "outgoing rotation group" data, used for the policy simulation later in this analysis. As Giannarelli, Morton, and Wheaton (2007) note, imputing hourly wages compounds measurement error from the three variables used in the imputation process, and can produce hourly wage values that fall below the statutory minimum wage of $7.25. However, as explained in Appendix A, these implied subminimum values, while certainly the product of error in some cases, may be indicative of troubling labor practices in others—and may even be accurate in others still. In any case, the ASEC data is one of the only public datasets with information on income from means-tested public assistance programs, and while not ideal, the imputed hourly wages provide adequate measures with which to assess utilization of these programs by relative levels of imputed hourly wages.

One other potential source of error comes from the fact that in the CPS data, receipt of income from public assistance is recorded as the total income from these sources received by all members of the family – meaning that each individual observation carries the family's total income from public assistance. In this analysis, for families with multiple workers, income from public assistance programs is divided evenly among workers. In a limited number of cases, this may create instances where the data report benefit receipt for individuals of the same family, yet separate tax units—such as adult siblings living together—where one of the respondents is not actually receiving benefits. Nevertheless, these are

likely a small number of cases and even in such cases, some portion of income may still be shared across tax units.

One final note on the data is that the CPS-ASEC data are known to significantly understate actual participation in, and income received from, public assistance programs. See Wheaton (n.d.) or Meyer, Mok, and Sullivan (2009) for details. Consequently, researchers will sometimes adjust the CPS-ASEC data to achieve consistency with administrative data that show actual program expenditures that are significantly higher, as is done in Allegretto et al (2013). In this analysis, I do not make any attempt to correct for this undercount. This means that the total level of benefits, the rate of receipt, and the magnitude of regression coefficients reported throughout this study almost certainly understate the true values.[ii] Furthermore, due to changes in Medicaid resulting from the Affordable Care Act that muddy the value of past experience on predicting future Medicaid expenditures, the fungible value of Medicaid benefits is not included in any calculations throughout this study.

The sample for the descriptive statistics and regression analysis that follows consists of the three years of CPS-ASEC data from March 2011, 2012, and 2013, reflecting respondents' economic conditions from 2010 to 2012. The sample is restricted to individuals ages 16 and older who worked for some portion of the year, and for whom a valid hourly wage value can be determined.

In the second part of the analysis, I use data from the CPS Outgoing Rotation Group (ORG) to identify the population likely to be affected by increasing the minimum wage to $10.10, and simulate the average increase in hourly wages for affected workers. I then use this information, combined with the results from the regression models, to predict the effect of increasing the federal minimum wage to $10.10 on public assistance enrollment and expenditures.

Incidence and value of government programs by annual hours of work, hourly wage decile, and industry

For this report, I look at participation in seven federal and state means-tested assistance programs for low-income families: the Earned Income Tax Credit (EITC); the Supplemental Nutrition Assistance Program (SNAP), also known as food stamps; the Low Income Home Energy Assistance Program (LIHEAP); the Supplemental Nutrition Program for Women, Infants, and Children (WIC); the Section 8 Housing Choice Voucher program; Medicaid; and the Temporary Assistance for Needy Families program (TANF) or equivalent state and local cash assistance programs.[iii]

For all of these programs, eligibility is restricted to individuals with low total family incomes—often some percentage of the federal poverty line. Certain programs may have additional requirements, such as family size, the presence of young children in the family, income below some percentage of the median rental cost in the person's region, or total family assets below a certain threshold. Most programs also are designed to "phase out" as family incomes rise—i.e., as a family's income increases,

benefits levels decrease at some proportional rate—although, Medicaid eligibility terminates above a specific threshold.

The EITC is slightly different. As a wage subsidy, qualifying beneficiaries of the EITC will receive larger benefits as their wage income rises, up to a certain point. At that point, benefits plateau at a maximum amount for a set range of income, and then begin to phase out beyond the end point of that maximum benefit range. Because of this structure, a low-income worker below the maximum benefit range could see their benefits increase as their wages went up, unless they experienced an increase in income large enough to put them on the downslope of the phase-out range.

As noted, inadequate levels of labor income can stem from a lack of adequate hours of work. Given the elevated rates of unemployment in the wake of the Great Recession, particularly for the three data years used in this study, this is a reasonable concern worth exploring. **Table 1** shows the receipt and value of benefits among workers and their families by annual hours of work. Workers are separated into groups working less than 1000 hours per year, 1000-1499 hours per year, 1500-1989 hours per year and 1990 hours or more, with this final category constituting regular full-time employment. As the table shows, two-thirds of all wage earners work annual hours that would constitute full-time, year-round employment. Among these workers, 17.3 percent receive some form of public assistance, either directly or through a family member. This is lower than the overall rate among all workers of 23.2 percent. In contrast, more than 40 percent of individuals working fewer than 1000 hours per year receive some form of public assistance. Similarly, 36.3 percent of individuals working 1000-1499 hours per year (effectively “half time”) receive some public assistance, as do 30.5 percent of individuals working 1500-1989 hours per year.

The distribution of beneficiaries also is informative. Individuals working fewer than 1000 hours per year make up about one tenth of all wage earners – yet close to one fifth of public assistance beneficiaries among working families (18.6 percent) falls into this group. Similarly, individuals working between 1000 and 1989 hours per year account for just over one fifth of all workers (22.1 percent), yet nearly one third of all working public assistance beneficiaries (31.2 percent). While it is, perhaps, not surprising that individuals with lower annual hours of work are disproportionately represented among recipients of public assistance, the share of recipients working full-time is still quite large: more than half (50.2 percent) of all recipients of public assistance among working individuals or their families works full time.

Looking at the distribution of beneficiaries across the various programs also shows some interesting results: half of all WIC beneficiaries work full time, as do 40 percent of Medicaid beneficiaries and 41 percent of food stamp recipients. The table also shows the distribution of program dollars by annual hours of work with most of the benefit dollars spread in roughly equal proportion to the share of beneficiaries in each work-hours category, although EITC benefits predictably skew more heavily towards those working more hours.

Of course, because of the structure of the data, where information on family benefit receipt is carried on each individual record, it is possible that some of the work-hours statistics reflect the work hours of family members who do not directly receive support from the applicable program. The extent to which this biases the results is unclear. Nevertheless, the reasonably large shares of individuals with family participation in these programs who work full time raises important questions about the function of these programs; namely, whether these programs are serving more as temporary supports during times of financial stress—as most were originally intended—or whether they have become more permanent wage subsidies for regular workers who are being paid wages that are simply unlivable.

Figure A shows the share of all wage earners whose families receive public assistance by hourly wage decile.[iv] As the figure shows, an estimated 23.2 percent of all wage earners receive benefits from at least one of the means-tested public assistance programs included in this study, either directly themselves or through a family member within the household. As we would expect given their lower hourly wages—and thus lower annual incomes—just over half (54.2 percent) of all workers with hourly wages in the bottom decile receive benefits or have a family member receiving benefits – more than double the overall rate of receipt. Among workers in the 2nd decile, just less than half (45.1 percent) receives benefits either directly or through a family member. As expected, the rates of receipt decline steadily as hourly wages increase. (All data on program utilization by wage decile is presented in **Appendix Table C1**.)

It is somewhat surprising that any workers with high hourly wage rates would show receipt of some public assistance. This result is likely caused by the noted issues with the data source: households containing with both high-income and low-income tax units from the same family. In such a case, the data would show a higher-income individual benefiting from the transfer dollars of their low-income family member when, in reality, the incomes of those individuals may be wholly separate. The other likely cause is individuals who work only a small portion of the year, yet report relatively large wage income for those limited annual hours of work, resulting in an imputed hourly wage that is artificially high.

Nevertheless, even with these potential sources of error, the data still show that the share of benefit recipients among high wage earners is small. As shown in **Figure B**, 88.3 percent of all wage earners in working families receiving public assistance have wages in the bottom half of the wage distribution. Just less than half (48.9 percent) of all recipients are in the bottom fifth of wage-earners, and over two-thirds have wages in the bottom 30 percent.

These high rates of receipt among workers in the bottom of the wage distribution strongly suggest that a substantial portion of working individuals are not earning enough from their labor to meet their basic needs, and are forced to turn to public assistance programs to supplement their low earnings.

Figure C shows the total value of public assistance benefits received by workers, either directly or through a family member, by the worker's hourly wage decile. Once again, the bulk of benefit dollars are

going to workers with the lowest wages. Workers with wages in the bottom decile of the wage distribution received over $22 billion in benefits, while workers with wages in the second decile—between the 10th and 20th percentile—received roughly another $20 billion in benefits. [v] The percentages below each dollar figure show the share of all benefit dollars going to the workers in that decile. Combining the bottom and second decile, workers in the bottom fifth of the wage distribution received approximately half of all public assistance dollars accruing to workers and their families.

While there are workers that benefit from public assistance across all major industry groups, some industries have much greater numbers of workers receiving benefits and much higher rates of receipt. In **Figure D,** the dark blue bar again shows that just over 23 percent of all workers in all industries have families receiving means-tested benefits. As the figure shows, workers in agriculture, forestry, fishing, and hunting have an exceptionally high rate of receipt: 43 percent of workers in this industry receive public assistance, either directly or through a family member – nearly double the rate of workers overall. Workers in the arts, entertainment, recreation, accommodation, and food services industries also have take-up rates of public assistance close to 40 percent. [vi] Wholesale and retail trade, construction, and other services except public administration all show rates of receipt above the national average of 23.2 percent. Workers in public administration had the lowest rate of utilization, with only 12.6 percent of workers in that industry receiving benefits.

Whereas **Figure D** showed rates of receipt within industries, **Figure E** shows the distribution of all wage-earners receiving benefits across industries. The industry with the largest share of all workers with families receiving benefits is education, health, and social services at 21.2 percent. However, this is also the largest industry category by far, containing roughly one quarter (24.7 percent) of all wage earners in the sample – thus, their share of benefit recipients is actually disproportionately low. In contrast, the wholesale and retail trade industries and the arts, entertainment, recreation, accommodation, and food service industries contain nearly one third (32.3%) of all public assistance recipients despite having less than a quarter (23.5 percent) of the total workforce. (The share of workers receiving benefits and of the overall workforce by industry is displayed in **Appendix Table C3**.) As expected given the rates of receipt in **Figure D**, Agriculture, forestry, fishing, and hunting also has a disproportionate number of workers receiving benefits; however, it is also one of the smallest segments of the workforce, containing less than 1 percent of all wage-earners.

Finally, **Figure F** shows the total value and share of public assistance dollars received by families of working individuals by the major industry employing each worker. Once again, the largest segment of benefit dollars goes to families with workers in education, healthcare, and social services. Workers or families of workers in these industries receive over $15 billion in public assistance, or 22.4 percent of all benefit dollars received by workers in the sample. However, this is a smaller percentage than their overall share of the workforce. The two major industry groups with disproportionately large shares of workers receiving benefits—wholesale and retail trade, and the arts, entertainment, recreation, accommodation, and food service industries—also receive a disproportionate share of total benefit dollars, with a combined 33.4 percent of benefit dollars or roughly $22.5 billion going to workers in

these industries. Note also that this share of benefit dollars exceeds these industries' share of recipients, suggesting that income and wage levels in these industries are particularly low.

Regression Analysis

This section examines how rates of receipt and the value of benefits change based upon changes in hourly wage rates. To do this, I use two sets of linear regressions. The first has binary dependent variables indicating whether the respondent or a family member in the household reported participation in, or positive income from, any of the seven public assistance programs under study. In the second set, the dependent variables are the total dollar value—in level terms—of benefits received from each program, as well as the sum of all benefits from all programs. For both sets of regressions, the explanatory variable of interest is the coefficient on real hourly wages. I employ a standard set of demographic controls (age, age-squared, age-cubed, gender, race, citizenship, marital status, and metropolitan status), as well as controls for industry, major occupation group, state, family size, number of children in the family, the number of wage earners in the family, whether the individual worked part-time at any point during the year, and the presence of any disabled persons in the household.

Effects are estimated for workers within three ranges of implied hourly wage values: 1) workers with wages between 95 percent of the statutory federal minimum wage of $7.25 and $15 per hour[vii]; 2) workers with wages in the range likely to be affected by a federal minimum wage increase to $10.10 – defined as workers with wages $7.25 and $11.50; and 3) workers with implied hourly wages below the federal minimum wage of $7.25.

Before discussing the regression results, I present data on the receipt of public assistance for workers in each range of wages. **Table 2** shows the estimated count and share of workers receiving benefits—either directly or through a family member—for those workers with hourly wages between $7.25 and $15 per hour. The table also reports the total value of benefits received by workers from each program and the average value of benefits, conditional on receipt. In this broad group of wage earners making up to $15 an hour, 14.2 million workers—roughly 37 percent—receive benefits from at least one program. Total benefits amount to nearly $40 billion, with an average total value of benefits received equal to just less than $3000. The program with the highest rate of participation is the EITC – 31 percent of workers with wages in this range receive benefits totaling over $24.5 billion. The second most commonly used program is SNAP (food stamps) with a participation rate at 11.2 percent and $9.1 billion in benefits received. Among the other programs, 7.5 percent of workers with wages in this range benefit from Medicaid, 5.0 percent benefit from WIC, 2.6 percent benefit from LIHEAP energy assistance, 2.0 percent benefit from Section-8 housing assistance, and 1.2 percent receives cash assistance from TANF or an equivalent state program.

Table 3 presents regression results for the group of workers with wages between $7.25 and $15 per hour. For the first set of results, the column labeled "coefficient on real hourly wages" indicates the expected percentage point change from a one dollar increase in hourly wages in the share of workers receiving public assistance benefits from each program. The results indicate that, holding all else

constant, for each additional dollar in hourly wages, the share of workers receiving benefits from any public assistance programs declines by 2.4 percentage points. For each individual program, the coefficients are negative and statistically significant in all cases. They range in magnitude from a reduction of 0.1 percentage points for the share receiving benefits from TANF to a reduction of 2.2 percentage points for the share receiving assistance from the EITC. For SNAP, a one dollar increase in hourly wages reduces the rate of participation by 1.2 percentage points; for Medicaid, 0.6 percentage points; for LIHEAP and WIC, 0.4 percentage points; and for Section-8 housing assistance, 0.3 percentage points. It is not surprising that the effects for TANF, Section-8, WIC and Medicaid are substantially smaller than the effect for the EITC—and to a lesser extent SNAP—simply because the share of workers participating in each of these programs is considerably smaller to begin with.

The second block of results in **Table 3** show the predicted effect from a one dollar increase in hourly wages on the value of benefits received for workers with wages between $7.25 and $15. The results indicate that for each additional dollar in hourly wages among workers in this range, benefit dollars received from all programs decline by roughly $114 per worker on average. As with the models predicting incidence, the coefficient on hourly wages is negative and statistically significant in all equations. The estimated effects are again largest for the EITC, with each dollar increase in hourly wages resulting in a $68 dollar decline in benefits on average per worker. The predicted effects for the other programs are: an average decline of $29 per worker in SNAP, $12 per worker for Section-8 housing assistance, $3 per worker for TANF, $2 per worker for WIC, and $1 per worker for LIHEAP.

Note that the sample for these regressions includes workers who do not receive any benefits from these programs. The inclusion of these zero values attenuates the coefficients, making them considerably smaller than they would be if the models were restricted to only those receiving benefits for each program. Again, the share of all wage earners in the $7.25 to $15 range receiving benefits from LIHEAP, TANF, and WIC in particular is quite small, meaning that the average effect among all workers in this range is necessarily going to be small as well. Excluding the zero values from the sample would more accurately describe how wage increases affect individual benefit amounts among beneficiaries, but that is a different question from the one being explored here. This paper's focus is on the average effect of raising the wages of workers on aggregate program spending, which requires accounting for those for whom there is no effect.

What these results show is that despite the relatively small average effect for particular programs, broadly increasing wages among workers earning between $7.25 and $15 could still lead to sizable savings in public assistance spending. For example, if a randomly-selected 10 million workers with wages in this range—just over a quarter of the 38.3 million workers earning between $7.25 and $15 per hour—received a $1 increase in their hourly pay, these findings predict that public assistance programs would save $1.14 billion. If a larger number of workers saw a pay raise or the wage increase were greater, the expected savings would be larger. Lifting wages for workers in this wage range could be achieved either actively through policy or as a result of market forces. The exact mechanism used would influence the particular subgroup of workers affected, which could change the magnitude of the effect on overall

spending levels or on particular programs. Yet the overarching conclusion remains that lifting wages for low-to-moderate wage workers would likely yield substantial public savings.

One obvious policy that could be used to broadly raise wages for this group, and particularly for workers at the bottom of this range, would be to raise the federal minimum wage. The most recent notable proposal at the federal level, the Fair Minimum Wage Act of 2014, would increase the federal minimum wage to $10.10 over a three-year phase-in period. The next section assesses utilization of public assistance among workers likely to be affected by such an increase, and the potential effect raising wages for these workers would have on public assistance spending.

Table 4 shows the estimated count and share of workers in the ASEC sample with imputed hourly wages between $7.25 and $11.50—the group likely to be affected by an increase in the federal minimum wage to $10.10. The upper bound for this subgroup is extended above $10.10 in order to account for anticipated "spillover" effects, where employers raise wages of employees just above the new wage floor in order to preserve internal wage ladders. The exact range of the spillover may be larger or smaller than $11.50, although spillovers have been measured extending up to 150 percent of the new binding wage floor under previous minimum wage increases, so this seems a reasonable cutoff point.[viii] This is also the range used in CBO (2014) which also utilized data from the CPS ASEC.

As the table shows, an estimated 23.3 million workers earn wages between $7.25 and $11.50 per hour. Among these workers, 44.3 percent (approximately 10.3 million) receive some form of public assistance—again, either directly themselves or through a family member. Just over one-third (37.2 percent) receive family income from the EITC; 14.5 percent receive food stamps; 9.5 percent receive cash assistance from TANF; 6.1 percent receive income from WIC; 3.5 percent receive energy assistance from LIHEAP; 2.8 percent receive Section-8 housing vouchers; and 1.4 percent participate in Medicaid.

The table also shows that these workers receive roughly $30 billion in income support from these programs, not including the value of Medicaid. Again, the largest programmatic spending is for the EITC with nearly $18 billion in benefits going to workers in this wage range. However, among recipients, the largest average benefit comes the Section-8 housing voucher program, with an average reported value of roughly $4,500, compared with $2,500 in annual benefits among SNAP beneficiaries, $2,500 in benefits for TANF beneficiaries, $2,000 in benefits for EITC recipients, and $3,100 in total overall benefits for those receiving income from any of the programs.

In order to examine how such a minimum wage increase might affect program utilization, **Table 5** shows regression results for the same two sets of regressions previously described but with the sample restricted to only those workers with wages between $7.25 and $11.50. The results show that for these workers, holding all else constant, a one dollar increase in hourly wages is predicted to reduce the share receiving benefits from any program by 3.1 percentage points. As with the larger sample of workers earning up to $15 per hour, the coefficient values are all negative and statistically significant. The largest predicted reduction in utilization rates would be for the EITC, with a 2.9 percentage point reduction in

receipt among these workers predicted for each dollar increase in hourly wages. For the other programs, the coefficient values imply a reduction of 1.4 percentage points in receipt for SNAP, a 0.7 percentage point reduction for Medicaid, a 0.6 percentage point reduction for LIHEAP, a 0.4 percentage point reduction for Section-8 and WIC, and a 0.2 percentage point reduction for TANF for each dollar increase in hourly wages.

The second set of results in the table again shows the predicted effects on total program spending. The results show that for workers in this group, each additional dollar in hourly wages reduces total benefits received from all programs by $124 on average per worker. The effects for individual programs, all negative and statistically significant, range from a reduction of $2 on average per worker for LIHEAP to a reduction of $66 on average per worker for EITC. These two findings – that higher wages for this group implies in a net decrease in aggregate spending, and a decrease specifically in spending on the EITC—are noteworthy because they indicate that the potential increase in EITC benefits for workers not receiving the maximum benefit prior to a minimum wage increase is unlikely to swamp the decrease in benefits for those that are receiving the maximum benefit. In other words, an increase in the minimum wage to $10.10 is likely to reduce net spending on these programs, even if EITC benefits go up for some workers.

Importantly, the effects on both utilization and aggregate spending are larger in all cases than measured for the broader group of workers earning between $7.25 and $15. This is not surprising as the income restrictions for each program concentrates receipt among the lowest-income families—thus we would expect to see larger effects among the lowest-paid workers in this range. One other notable difference in the effects for this group versus for the larger group of workers up to $15 is that the reduction in aggregate benefits from all programs except the EITC is larger than the reduction in EITC benefits; whereas for the full sample of workers from $7.25 to $15, the effect for the EITC is larger than the combined effects on all other programs. This is likely a result of the EITC's broader reach up the income distribution, as its phase-out range extends to higher income levels than most, if not all, of the other programs in this study. Consequently, the inclusion of higher-wage workers in the sample makes the EITC dominant in affecting total spending across all programs.

Simulation and Policy Implications

Given that the public assistance programs examined in this paper are all means-tested, it should not be surprising that, holding all else constant, increases in hourly wage rates imply reductions in program utilization and expenditures for most of these programs. The fact that wage increases for workers likely to be affected by a minimum wage increase to $10.10 also reduce expenditures on the EITC affirms this presumption. It is also informative, however, to have some sense of the magnitude of these reductions, particularly if policy interventions are considered as a means of raising hourly wages. In this section I attempt to quantify the potential reduction in program utilization and spending that would occur from an increase in the federal minimum wage to $10.10 per hour, as proposed under the Fair Minimum Wage Act of 2014.

As explained in Cooper (2013), the Fair Minimum Wage Act of 2014 would increase the federal minimum wage from $7.25 to $10.10 per hour in three increments of $0.95 over three years. Using the methodology from Cooper (2013)—explained in Appendix B—such an increase is predicted to raise the pay of over 27 million workers, after accounting for spillovers.[ix x] The average affected worker would receive a raise of $1.61 per hour. Applying the coefficient values from the equations in **Table 5** to this $1.61 average raise yields a predicted reduction in the share of workers receiving any public assistance of 5.0 percentage points among the affected group, or roughly 1.4 million workers. Similarly, the predicted effects from **Table 5** imply that such a wage increase would reduce total benefit dollars from all government assistance by an average of $200 annually among affected workers, or over $5.4 billion in total. Again, it should be noted that these results do not account for the well-established undercount of public assistance benefits in the CPS data, meaning that the actual effects on utilization and program spending is likely to be considerably larger than these estimates.

Conclusion

For millions of Americans struggling to make ends meet, government-provided support programs serve as critical protections against undue hardship. Yet high rates of participation in these programs by individuals working significant annual hours suggest that current wage floors are inadequate to provide livable levels of income. Raising the federal minimum wage would increase wages for tens of millions of workers – lifting family incomes, and reducing reliance on public assistance. Although higher wages may increase benefit amounts for some recipients of the EITC, the net effect would still be a decline in EITC spending and overall transfer outlays, providing savings to safety net programs that could be repurposed into any number of other anti-poverty efforts or public investments.

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Appendix A: Discussion of Imputed Subminimum Hourly Wage Values in the CPS-ASEC

For the vast majority of observations within the ASEC sample, imputing an hourly wage from the respondent's reported annual wage income, weeks worked per year, and usual hours worked per week yields a plausible hourly wage value. However, for a small, but not insignificant portion of the sample—8.3 percent—imputed wage values fall below the federally mandated minimum wage of $7.25 per hour. Some of these values fall below the wage floor almost certainly due to measurement error, compounded by the imputation process; it can be difficult for individuals to accurately recount their total wage income and total time in the workforce for a 12-month period three months removed—especially if they changed jobs, worked only a portion of the year, or worked inconsistent hours.

Appendix Figure AA shows the distribution of all imputed wage values below the federal minimum wage (hereafter referred to as "subminimum wage values") and the distribution of all imputed wage values, both as shares of their respective totals, by respondents' reported usual hours worked per week. The distribution shows that subminimum wage values are more likely to occur for individuals who worked fewer than 35 hours per week. **Appendix Figure AB** shows the distribution of subminimum wage values and total wage values by respondents' reported weeks worked in the previous year. As expected, there is a consistently higher prevalence of subminimum wage values among individuals who worked only part of the year.

The Census Bureau takes steps to validate responses, and reduce potentially invalid data, but unfortunately, the low-wage labor market is prone to characteristics that can aggravate measurement error: turnover is high, work is more likely to be seasonal or part-time, and many low-wage jobs suffer from inconsistent hours (CBO 2006). This means that workers whose actual hourly wage may have been above, yet close to, the minimum wage may be particularly prone to err in their reporting of any of the three data points needed to impute their hourly wage.

Given these challenges, some researchers have been wary to use these implied hourly wages (see Giannarelli, Morton, and Wheaton 2007.) Yet rather than simply dismissing these questionable values outright, a more thorough examination suggests that perhaps not all these subminimum wage values are the result of measurement error. In fact, some may be indicative of significant gaps in legal protections, and troubling real-world labor practices.

For example, certain groups of workers are exempt from the minimum wage provisions of the Fair Labor Standards Act (FLSA), such as farmworkers on small farms, employees of some seasonal and recreational establishments, fishermen, newspaper delivery workers, and anyone employed by a business with less than $500,000 in annual revenue that does not engage in interstate commerce. (U.S. Department of Labor, 2014) For workers that fall into these categories, their low imputed hourly wage values may be entirely correct and legal.

For others, however, implied hourly wages below the minimum wage may indicate greater incidence of wage theft. As explained in Meixell and Eisenbrey (2014), wage theft—the practice of employers not paying workers the full wages that they are owed—is a significant problem, particularly in low-wage jobs that costs American workers hundreds of millions, if not billions, of dollars each year.[xi]

Appendix Tables A2 and **A3** show the occupations with the highest shares and highest incidence, respectively, of subminimum imputed wage values. Highlighted occupations appear in both tables. Many of these jobs listed represent the lowest-paying jobs in our economy, and indeed, several occupations that appear in this list may not be covered by the FLSA or other federal labor and employment laws, such as home health aides, personal and home care aides, and agricultural workers[xii].

Many other occupations in these lists are tipped occupations: waiters and waitresses; counter attendants, cafeteria, food concession, and coffee shop workers; food servers, non-restaurant; bartenders; bartender helpers; hairdressers, hairstylists, and cosmetologists. Allegretto and Cooper (2014) explain how problems of wage theft and workers receiving wages below the prevailing minimum wage are particularly acute among tipped workers due to "tip credit" provisions in minimum wage laws that allow employers of tipped workers to pay them a base wage as low as $2.13 per hour. While these employers are legally required to make up any shortfalls between the effective hourly rate earned by tipped workers from their tips and the prevailing minimum wage, enforcement of this requirement is highly problematic and the system is rife with abuse.

Finally, many of these occupations are frequently held by immigrants. In fact, of the 15 occupations most commonly held by immigrants, 10 appear in **Appendix Table A2**: cooks; housekeepers, maids, and butlers; nursing aides; janitors; truck, delivery, and tractor drivers; construction laborers; cashiers; gardeners and groundskeepers; retail sales clerks; and farm workers.[xiii] Some of these immigrant workers may be undocumented, while others may be working on temporary work visas that restrict ability to change jobs—both scenarios that can leave these workers powerless against exploitive employers.

We can also look at the prevalence of subminimum wage values by industry. **Appendix Tables A4** and **A5** show the industries with the highest share and highest incidence, respectively, of wage values below the federal minimum. Highlighted industries again appear in both tables. As with the distribution by occupation, one can surmise plausible reasons for why workers in many of these industries may have been underpaid for the total hours they worked in a given year—thus bringing their implied hourly wage below the federal minimum—either as a result of unscrupulous employers or gaps in labor protections. For example, restaurants again appear prominently in both lists, which is expected given the high incidence of subminimum values for waiters and waitresses, cooks, and other food service occupations. Workers in recreational parks and camps (e.g., campgrounds) have the highest rate of imputed subminimum values, likely because many such facilities are seasonal and not covered by the FLSA. Similarly, some workers in animal production facilities, crop production facilities, and home health care services industries may also lack FLSA protections. Workers in private households also show high

incidence of subminimum imputed wage values, which could be the result of informal or "under the table" arrangements, which Shierholz (2013) notes leave workers particularly vulnerable to violations of labor standards. Finally, as with the top occupations with subminimum imputed wage values, many of these industries are also disproportionately staffed by immigrants, some of whom may be subject to exploitation due to their immigration status.

To be clear, these data cannot and should not be viewed as conclusive evidence of wage theft or labor abuses in any particular occupation or industry. However, the high prevalence of what should, in most cases, be impossibly-low imputed wage values should raise questions about how workers are being paid and the hours they are expected to work in many of these jobs.

To the extent that these subminimum wage values represent instances of wage theft or gaps in labor standards, there may be public savings to be had from better enforcement of labor law or expansions in coverage to workers either outright excluded from the FLSA, such as seasonal farm workers, or treated as a separate class of workers, such as tipped workers.

Appendix Table A6 shows rates of receipt and the total value of benefits paid out to workers with imputed hourly wages below $7.25. Among these workers, 54.9 percent report receiving some form of public assistance, with total benefits from all programs totaling nearly $15 billion. Again, the program with the highest rate of incidence is the EITC – 48.2 percent of workers in this wage range receive roughly $7.3 billion in benefits. Participate in SNAP is also relatively common, with 17.9 percent of workers in this group receiving $4.2 billion in benefits. Participation rates for the other programs are: 12.2 percent for Medicaid, 6.9 percent for WIC, 4.1 percent for LIHEAP, 3.6 percent for Section-8, and 2.0 percent for TANF. The average total amount of benefits received among beneficiaries of any program is about $2,700, while the largest average benefit among the individual programs is again for recipients of Section-8 housing vouchers, who receive an average benefit worth $5,125.

The regression results for this group are presented in **Appendix Table A7**. As with the results for workers with wage values between $7.25 and $15, increasing wages for this group is predicted to reduce the share receiving public assistance – in this case, by 2.8 percentage points from every dollar increase in hourly wages. However, the coefficient on real hourly wages is only significant on the models for two of the seven individual programs: the EITC and Section-8. For the EITC, participation declines significantly by 3.1 percentage points for every dollar increase in wages; for Section-8, the decline is 0.4 percentage points. For all the other programs, the coefficient values are not statistically different from zero at the 90 percent level.

In the regressions on the value of benefits, the results are also mixed. The coefficient on the value of all benefits is positive, suggesting that benefits for workers in this group could increase in aggregate on average if their wages rose, although this result is not statistically significant. We can see, however, that this positive value is driven, as expected, from the EITC. The results for the EITC show that for every additional dollar in hourly wages, aggregate EITC dollars for workers in this group would increase by an

average of $66 per worker. Yet at the same time, the value of benefits from all other programs would decrease by an average of $41 per worker, including a significant decline in SNAP spending of $16 on average per worker.

It is not clear what conclusions can be drawn from the results for these workers, in light of the fact that their imputed hourly wages are subject to considerable error. The regression results suggest that in cases where reported subminimum values do indicate instances of wage theft or gaps in FLSA coverage, workers may be entitled to greater income, not only from their employer, but from the tax and transfer system as well.

Appendix B. Minimum wage impact estimation methodology

To assess the number of workers likely to be affected by a minimum wage increase to $10.10, I use a microsimulation model that utilizes four quarters of microdata from the Current Population Survey's outgoing rotation group, in this case covering calendar year 2013. The outgoing rotation group (ORG) is the group of CPS respondents in either the fourth or twelfth month of survey participation. In these months, respondents are asked about their hourly rate of pay in the preceding week, thereby providing one of the most reliable estimates of true hourly wage rates for workers in the United States. Before making use of the data, values are "cleaned" and imputations made, where necessary, as described in Mishel et al. (2012), appendix B. The ORG data to individuals age 16 and older, with valid wage values as described in Mishel et al (2012), and who report that they are currently employed.

The model also uses data from a manually-compiled dataset of all applicable state and/or federal minimum wage rates for all states, by month and year, from January 1984 onward. Minimum wage rates for states with scheduled state minimum wage increases and/or annual indexing for inflation are projected using CBO-projections for inflation, published in the August 2014 CBO Annual Budget and Economic Outlook.

Sorting the data by state, wage values are first adjusted for individuals in states where a state minimum wage increase occurs between the data period and the first proposed increase in the minimum wage proposal being analyzed. For example, the simulation in this study uses 2013 data, yet simulates the federal minimum wage being increased in 2015, 2016, and 207. The minimum wage in New Jersey rose to $8.25 on January 1, 2014 – thus some respondents in New Jersey with wages below $8.25 at the time of the survey will already have higher wages before any proposed federal increase could take place. In these states, reported wage values below the state minimum wage that is expected in the month prior to the proposed new federal minimum wage are increased in direct proportion to the expected new minimum. For example, if someone in New Jersey in August 2013 was earning 105% of the August 2013 New Jersey minimum, their wage is adjusted to 105% of the expected New Jersey minimum for June 2014, if the proposed federal increase is modeled to occur in July 2014.

After making these adjustments, the wages of workers in all states are adjusted under the assumption that there will be some natural nominal wage growth between the survey period and the implementation period of the higher minimum wage. For the simulation in this paper, I assume nominal wage growth of 1.51%, the average annual wage growth for the bottom quintile of U.S. wage earners from 2010 to 2013, nationwide, according to the CPS ORG.

Person weights in the sample are also adjusted for projected population growth between the survey period and the proposed wage floor increase. I adjust the ORG weights by the projected annual U.S. population growth rate from 2014 to 2020 – 0.77 percent, according to the Census Bureau (http://www.census.gov/population/projections/). This annual growth rate is further adjusted by the number of months that occur between the midpoint of the data and the month that the first proposed minimum wage increase would occur. (In other words, if 15 months occurred between the midpoint of the data and the proposed new minimum, the assumed population growth is (15/12) x 0.77 percent.)

Having made these adjustments, the model identifies "directly affected" workers as those workers whose wages are greater than or equal to 95% of the prevailing minimum wage and less than the proposed federal minimum wage, in states where the prevailing minimum wage is less than the proposed federal minimum. The model also identifies "indirectly affected" workers as those whose wages are greater than or equal to the proposed federal minimum wage, but less than the proposed minimum plus the dollar value of the proposed increase – hereafter referred to as the "indirectly affected cutoff". For example, for an increase from $7.25 to $8.20, directly-affected workers have a wage between 95 percent of $7.25 and $8.20. The size of the increase is $0.95; thus, indirectly-affected workers are those workers with wages between $8.20, inclusive, and $9.15, exclusive. The indirectly-affected cutoff in this case would be $9.15.

If the increase being model has more than one step, the program iterates to the next proposed increase after having counted these directly and indirectly-affected workers.

If an individual is predicted to be either directly or indirectly affected, their wage is adjusted to reflect their implied raise. For directly-affected workers, their raise is equal to the difference between the new minimum wage and their existing wage. For indirectly-affected workers, their raise is modeled as $1/4^{th}$ the difference between their existing wage and the indirectly-affected cutoff. For example, an indirectly-affected worker previously earning $8.50 would receive a raise of 0.25 x ($9.15-$8.50) = $0.16.

Again, weights are adjusted to reflect the predicted population growth between each increment in the proposed minimum wage increase. Wage values are also again adjusted in states with scheduled minimum wage increases and adjusted to reflect natural nominal wage growth. However, for the second and third phases of the simulation, I assume natural nominal wage growth equal to the average annual nominal wage growth of the bottom quintile of wage earners from 2002 – 2006 in the CPS ORG, on a state-by-state basis. This period is used because it is the last full regular business cycle and is thus more likely to reflect typical wage trends than the recent recessionary and post-recessionary years.

The same method for identifying directly- and indirectly-affected workers is applied, and the counts are recorded. Once again, expected raises are applied based upon the described formula; wages are adjusted for scheduled state increases and natural nominal growth; and weights are adjusted for projected population growth. Directly- and indirectly-affected workers are counted once more for the third and final proposed increase.

Tables and Figures

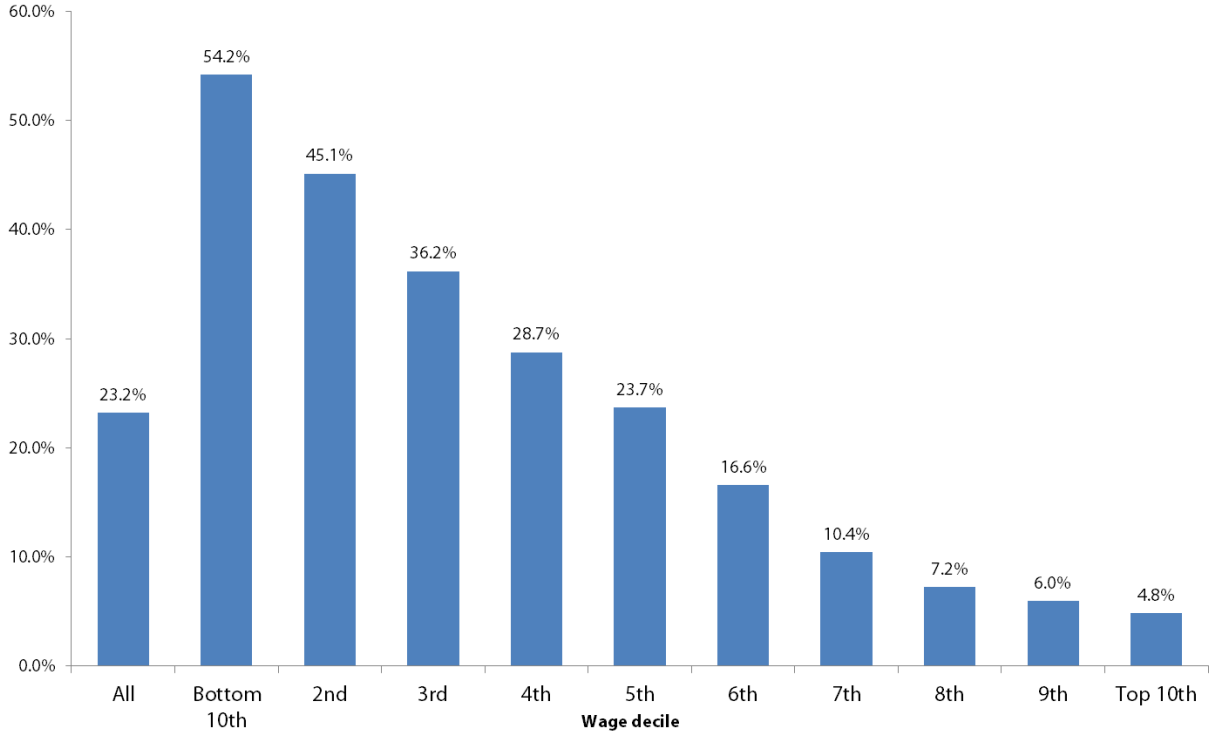
Table 1. Receipt of means-tested government assistance by program and annual hours worked

	Annual hours	All	Less than 1000 hours	1000-1499 hours	1500-1989 hours	1990+ hours
	Total wage-earning population	**122,195,870**	**12,872,773**	**10,789,318**	**16,177,897**	**82,355,882**
	Share	100.0%	10.5%	8.8%	13.2%	67.4%
Any government assistant	**Count**	28,326,932	5,256,548	3,918,814	4,927,522	14,224,049
	Incidence	23.2%	40.8%	36.3%	30.5%	17.3%
	Share of all recipients	100.0%	18.6%	13.8%	17.4%	50.2%
	Total benefit dollars	$ 67,551,564,175	$ 12,623,992,979	$ 10,398,486,828	$ 13,692,169,939	$ 30,836,914,429
	Share of all assistance	100.0%	18.7%	15.4%	20.3%	45.6%
	Mean value of benefits received	$2,602	$2,579	$2,863	$3,009	$2,393
Earned-income tax credit (EITC)	**Count**	22,942,294	4,388,927	3,224,934	4,009,038	11,319,395
	Incidence	18.8%	34.1%	29.9%	24.8%	13.7%
	Share of EITC recipients	100.0%	19.1%	14.1%	17.5%	49.3%
	Total value of EITC benefits	$ 40,168,169,034	$ 5,446,764,423	$ 5,577,250,715	$ 8,192,414,142	$ 20,951,739,753
	Share of EITC benefits	100.0%	13.6%	13.9%	20.4%	52.2%
	Mean value of benefits received	$1,751	$1,241	$1,729	$2,043	$1,851
Energy assistance (LIHEAP)	**Count**	1,746,805	479,058	304,371	360,481	602,895
	Incidence	1.4%	3.7%	2.8%	2.2%	0.7%
	Share of LIHEAP recipients	100.0%	27.4%	17.4%	20.6%	34.5%
	Total value of LIHEAP benefits	$ 620,684,815	$ 170,256,796	$ 116,056,217	$ 121,450,627	$ 212,921,175
	Share of LIHEAP benefits	100.0%	27.4%	18.7%	19.6%	34.3%
	Mean value of benefits received	$355	$355	$381	$337	$353
Food stamps (SNAP)	**Count**	7,804,465	1,759,063	1,285,163	1,556,909	3,203,330
	Incidence	6.4%	13.7%	11.9%	9.6%	3.9%
	Share of SNAP recipients	100.0%	22.5%	16.5%	19.9%	41.0%
	Total value of SNAP benefits	$ 16,496,145,848	$ 3,992,550,414	$ 2,878,063,846	$ 3,302,431,337	$ 6,323,100,252
	Share of SNAP benefits	100.0%	24.2%	17.4%	20.0%	38.3%
	Mean value of benefits received	$2,500	$2,573	$2,568	$2,531	$2,412
Housing assistance	**Count**	1,350,341	385,110	267,400	298,058	399,773
	Incidence	1.1%	3.0%	2.5%	1.8%	0.5%
	Share of housing assistance recipients	100.0%	28.5%	19.8%	22.1%	29.6%
	Total value of housing benefits	$ 6,181,626,937	$ 1,976,250,452	$ 1,254,431,610	$ 1,320,498,086	$ 1,630,446,789
	Share of housing benefits	100.0%	32.0%	20.3%	21.4%	26.4%
	Mean value of benefits received	$4,578	$5,132	$4,691	$4,430	$4,078
Medicaid	**Count**	5,961,691	1,514,856	1,017,015	1,047,518	2,382,303
	Incidence	4.9%	11.8%	9.4%	6.5%	2.9%
	Share of Medicaid beneficiaries	100.0%	25.4%	17.1%	17.6%	40.0%
TANF / Cash assistance	**Count**	886,720	279,127	137,024	172,933	297,635
	Incidence	0.7%	2.2%	1.3%	1.1%	0.4%
	Share of TANF recipients	100.0%	31.5%	15.5%	19.5%	33.6%
	Total value of TANF benefits	$ 2,228,156,939	$ 727,723,083	$ 318,886,245	$ 403,287,102	$ 778,260,508
	Share of TANF benefits	100.0%	32.7%	14.3%	18.1%	34.9%
	Mean value of benefits received	$2,513	$2,607	$2,327	$2,332	$2,615
Supplemental Nutrition for Women, Infants, and Children (WIC)	**Count**	3,578,889	602,511	479,459	690,998	1,805,922
	Incidence	2.9%	4.7%	4.4%	4.3%	2.2%
	Share of WIC recipients	100.0%	16.8%	13.4%	19.3%	50.5%
	Total value of WIC benefits	$ 1,856,780,602	$ 310,447,811	$ 253,798,194	$ 352,088,645	$ 940,445,951
	Share of WIC benefits	100.0%	16.7%	13.7%	19.0%	50.6%
	Mean value of benefits received	$519	$515	$529	$510	$521

Note: All shares reflect shares of working recipients.

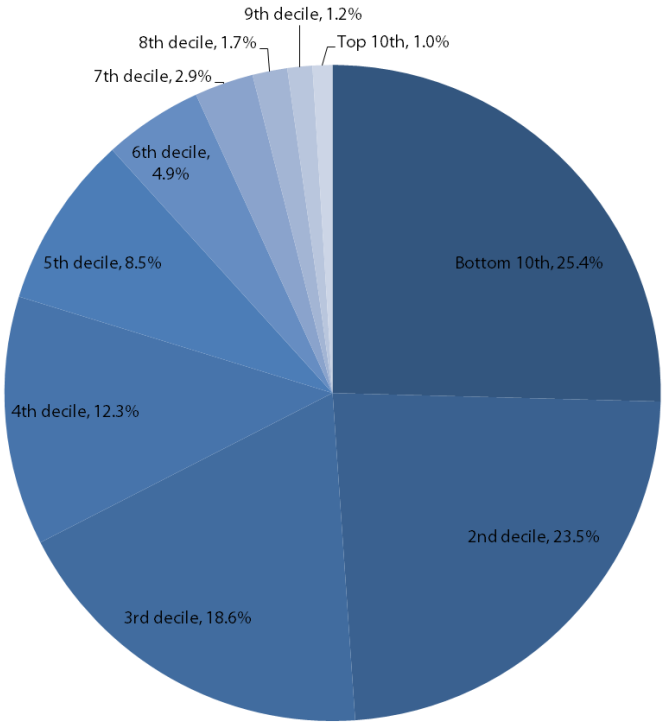
Source: Author's analysis of Current Population Survey, Annual Social and Economic Supplement microdata, pooled years 2011-2013

Figure A Share of wage earners whose families receive means-tested public assistance, by hourly wage decile



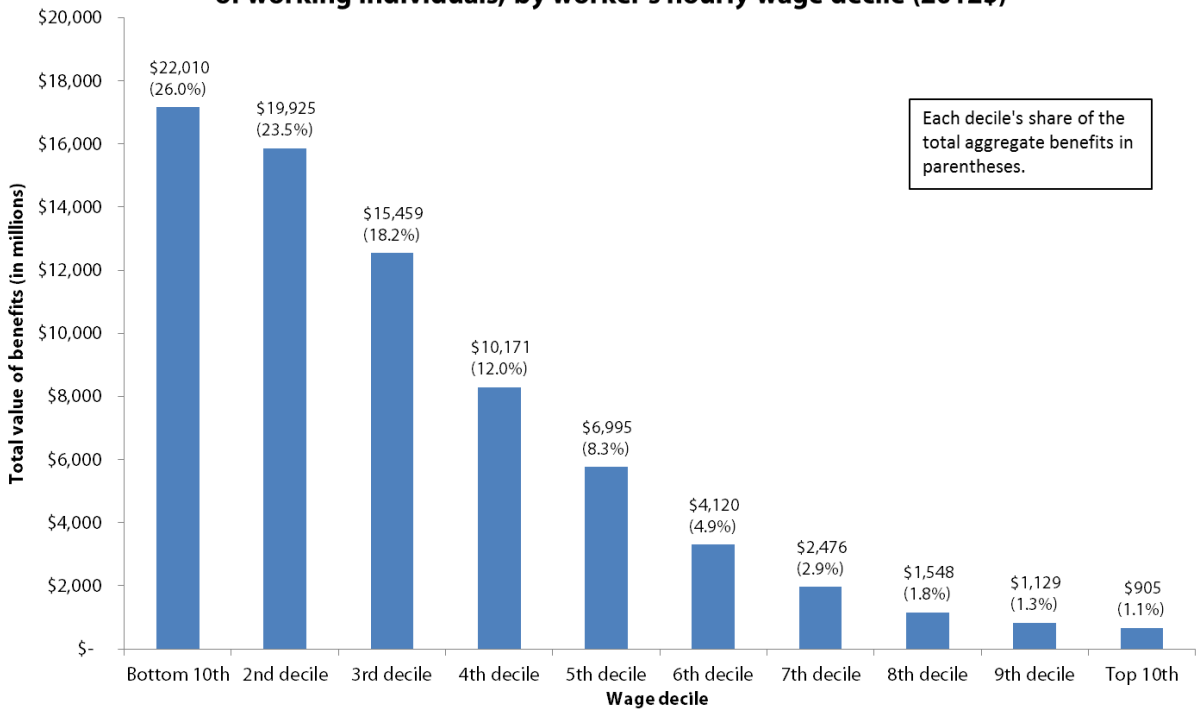
Note: Includes the EITC, SNAP, LIHEAP, WIC, housing assistance, TANF/cash assistance, and Medicaid
Source: Author's analysis of Current Population Survey, Annual Social and Economic Supplement microdata, pooled data years 2011-2013

Figure B. Distribution of all wage earners in families receiving public assistance, by hourly wage decile



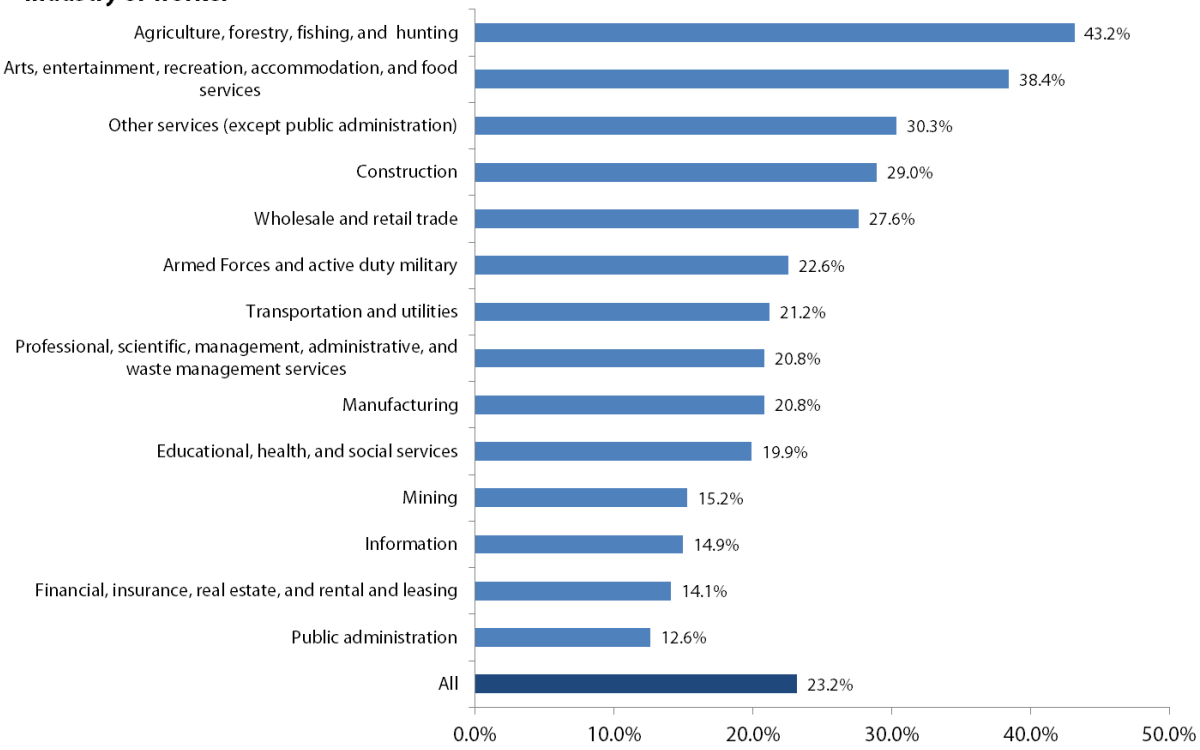
Note: Includes the EITC, SNAP, LIHEAP, WIC, housing assistance, TANF/cash assistance, and Medicaid
Source: Author's analysis of Current Population Survey, Annual Social and Economic Supplement microdata, pooled data years 2011-2013.

Figure C Total value of benefits from public assistance programs to families of working individuals, by worker's hourly wage decile (2012$)



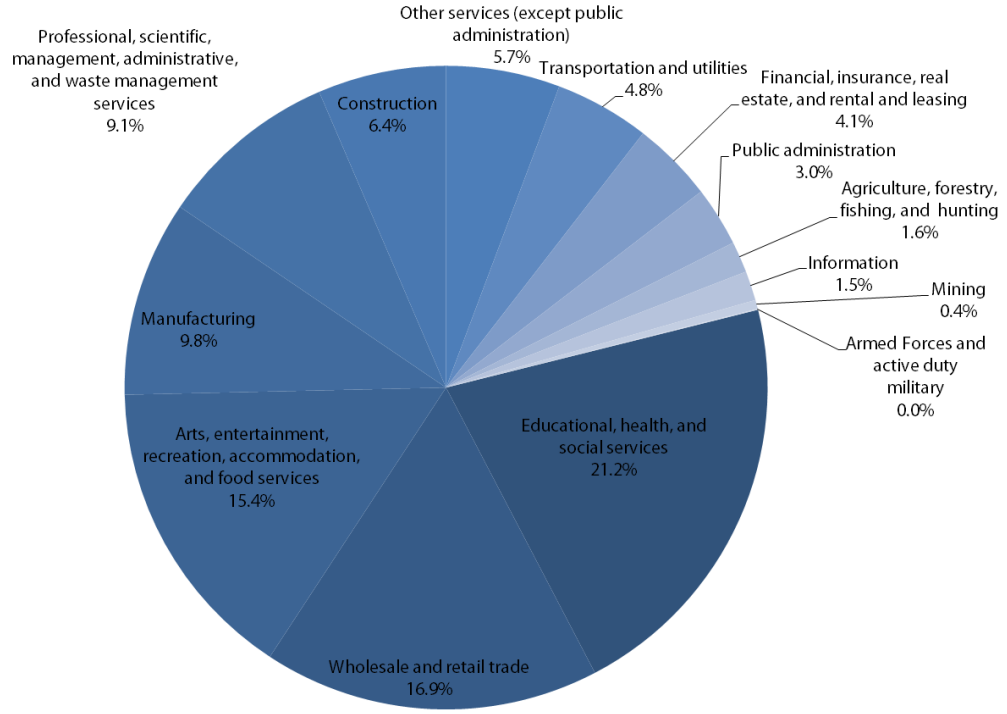
Note: These data do not include the value of Medicaid. Values reflect reported benefits from all other programs in this study received by workers, but do not include administrative costs. Also,it is well known that the CPS data significantly understate total benefits paid to beneficiaries, thus these values do not reflect total spending on these assistance programs.
Source: Author's analysis of Current Population Survey, Annual Social and Economic Supplyment microdata, pooled years 2011-2013

Figure D Share of wage earners whose families receive means-tested public assistance, by major industry of worker



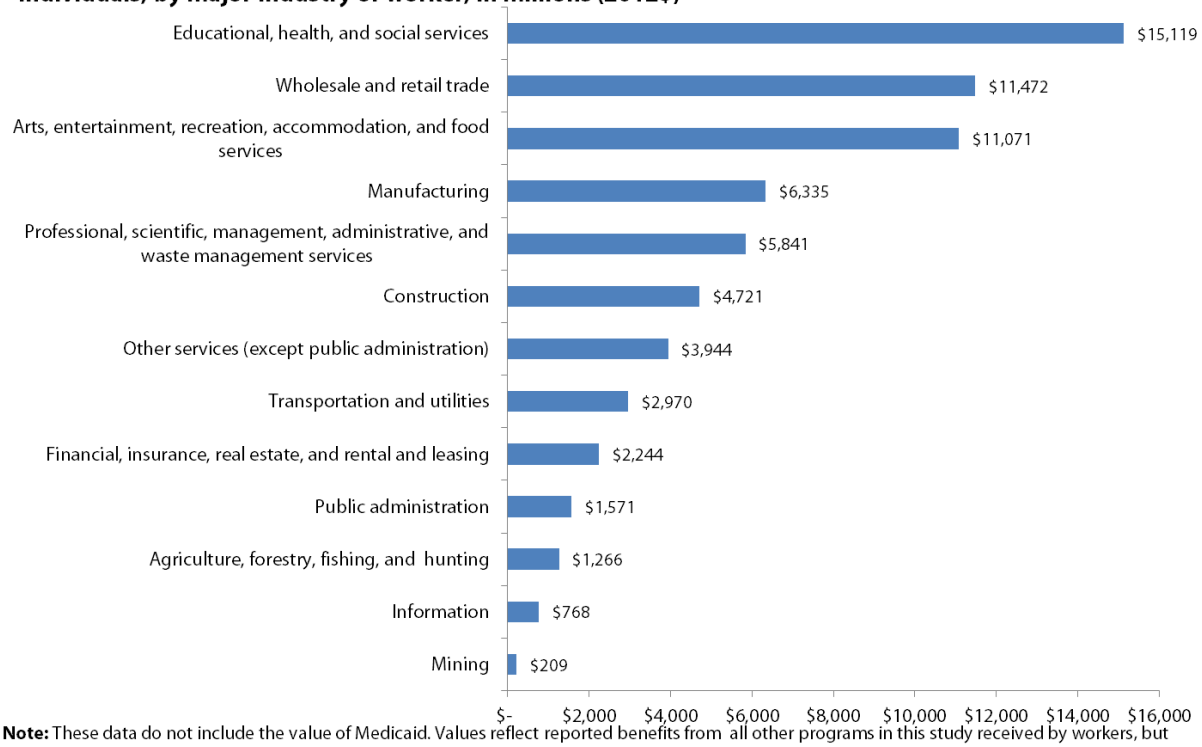
Note: Includes the EITC, SNAP, LIHEAP, WIC, housing assistance, TANF/cash assistance, and Medicaid
Source: Author's analysis of Current Population Survey, Annual Social and Economic Supplement microdata, pooled data years 2011-2013

Figure E. Distribution of all wage-earners in families receiving public assistance, by major industry of worker



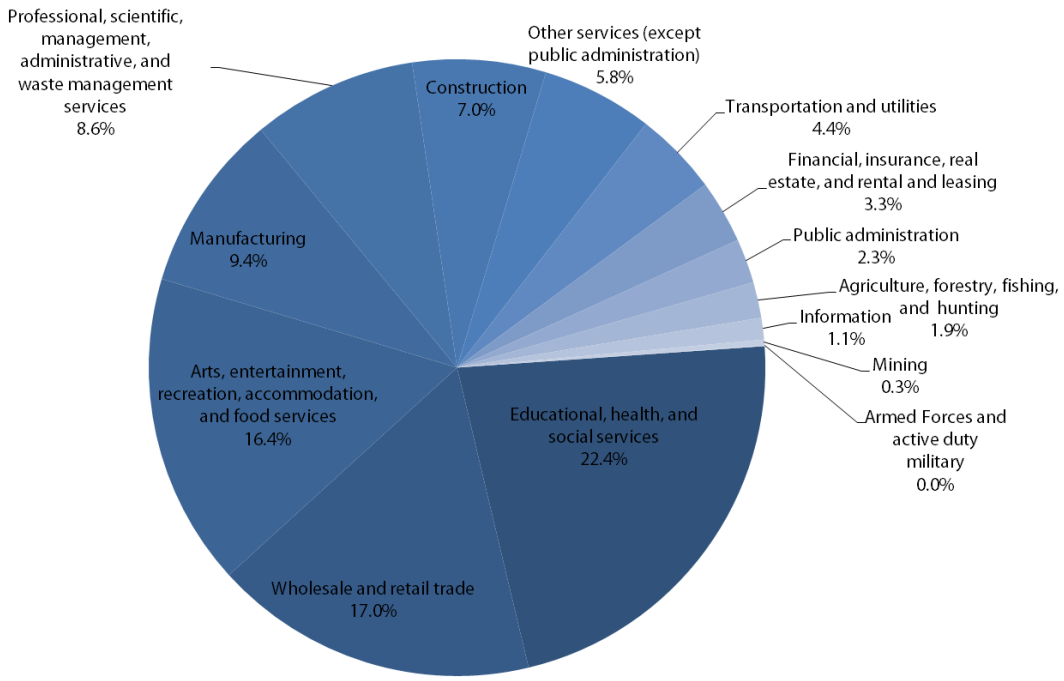
Note: Includes the EITC, SNAP, LIHEAP, WIC, housing assistance, TANF/cash assistance, and Medicaid
Source: Author's analysis of Current Population Survey, Annual Social and Economic Supplement microdata, pooled data years 2011-2013.

Figure F Reported total value of benefits from public assistance programs to families of working individuals, by major industry of worker, in millions (2012$)



Note: These data do not include the value of Medicaid. Values reflect reported benefits from all other programs in this study received by workers, but do not include administrative costs. Also,it is well known that the CPS data significantly understate total benefits paid to beneficiaries, thus these values do not reflect total spending on these assistance programs.
Source: Author's analysis of Current Population Survey, Annual Social and Economic Supplyment microdata, pooled years 2011-2013

Figure G. Share of benefits from public assistance programs to families of working individuals, by major industry of worker (2012$)



Note: Includes the EITC, SNAP, LIHEAP, WIC, housing assistance, andTANF/cash assistance.
Source: Author's analysis of Current Population Survey, Annual Social and Economic Supplement microdata, pooled data years 2010-2012.

Table 2. Receipt of public assistance among families of workers with imputed hourly wages between $7.25 and $15

Estimated count of all workers in this wage range	38,392,514			
Family receives:	**Count**	**Share**	**Total benefits received**	**Mean value of benefits received (among those receiving benefits)**
Any government assistance	14,279,784	37.2%	$39,583,855,300	$2,970
Earned income tax credit (EITC)	11,887,334	31.0%	$24,568,187,166	$2,067
Energy assistance (LIHEAP)	1,006,296	2.6%	$361,085,277	$359
Food stamps (SNAP)	4,314,014	11.2%	$9,128,253,022	$2,523
Housing assistance	771,472	2.0%	$3,437,318,993	$4,456
Medicaid	442,354	1.2%	$1,093,146,902	$2,471
TANF / Cash assistance	2,889,894	7.5%		
Supplemental Nutrition for Women, Infants, and Children (WIC)	1,906,815	5.0%	$995,863,940	$522

Source: Author's analysis of Current Population Survey, Annual Social and Economic Supplement microdata, pooled years 2011-2013

Table 3. Effect of increasing wages on incidence of receipt and value of public assistance benefits for workers with wages between $7.25 and $15

Model depedent variable	**Coefficient on real hourly wages**	**S.E.**	**P > |t|**	**Model N**	**Adj-R^2**
Incidence of:					
Any aid	-0.024***	0.00	0.000	55,427	0.260
Earned-Income Tax Credit (EITC)	-0.022***	0.00	0.000	55,427	0.270
Energy assitance (LIHEAP)	-0.004***	0.00	0.000	55,427	0.036
Food stamps (SNAP)	-0.012***	0.00	0.000	55,427	0.120
Housing (Section-8)	-0.003***	0.00	0.000	55,427	0.037
Medicaid	-0.006***	0.00	0.000	55,427	0.068
TANF / Cash assistance	-0.001***	0.00	0.000	55,427	0.022
WIC	-0.004***	0.00	0.000	55,427	0.089
Value of:					
All transfers	-114.3***	3.70	0.000	55,427	0.355
All transfers, except EITC	-46.2***	2.55	0.000	55,427	0.145
Earned-Income Tax Credit (EITC)	-68.1***	2.16	0.000	55,427	0.388
Energy assistance (LIHEAP)	-1.1***	0.14	0.000	55,427	0.025
Food stamps (SNAP)	-28.7***	1.69	0.000	55,427	0.141
Housing	-12.0***	1.29	0.000	55,427	0.033
TANF/Cash assistance	-2.6***	0.70	0.000	55,427	0.016
WIC	-1.8***	0.25	0.000	55,427	0.082

Note: Universe is wage-earners who worked in the previous year with imputed real wage values between $6.89 (95% of $7.25) and $15. Models include controls for age, age^2, age^3, sex, race, worked part-time at any point previous year, marital status, family size, presence of a disabled person in the household, number of children under 18, citizenship, metropolitan status, state,

Source: Author's analysis of Current Population Survey, Annual Social and Economic Supplement microdata, pooled years 2011-2013

Table 4. Receipt of public assistance among families of workers likely affected by a minimum wage increase to $10.10

Workers likely affected by a minimum wage increase*	23,328,823			
Family receives:	**Count**	**Share**	**Total benefits received**	**Mean value of benefits received (among those receiving benefits)**
Any government assistance	10,331,311	44.3%	$29,995,963,736	$3,090
Earned income tax credit (EITC)	8,680,441	37.2%	$17,876,246,197	$2,059
Energy assistance (LIHEAP)	810,723	3.5%	$279,921,876	$345
Food stamps (SNAP)	3,390,994	14.5%	$7,336,306,392	$2,573
Housing assistance	655,378	2.8%	$2,940,192,082	$4,486
Medicaid	333,219	1.4%		
TANF / Cash assistance	2,221,494	9.5%	$833,756,368	$2,502
Supplemental Nutrition for Women, Infants, and Children (WIC)	1,420,323	6.1%	$729,540,820	$514

Note: *Reflects wage-earners in the CPS-ASEC with imputed hourly wages in the range likely to be affected by a minimum wage increase to $10.10. As discussed in Appendix A, the hourly wage values imputed from the CPS-ASEC data are less robust than the reported hourly wages in the CPS-ORG data set we typically use for estimating who would be affected by a minimum wage increase to $10.10. We must use the CPS-ASEC data to assess receipt of public benefits, but the number of workers likely to be affected by a minimum wage increase to $10.10 in the CPS-ASEC data is significantly smaller than estimated using the CPS-ORG data. Thus, the count here very likely understates the actual number of workers that would

Source: Author's analysis of Current Population Survey, Annual Social and Economic Supplement microdata, pooled years 2011-

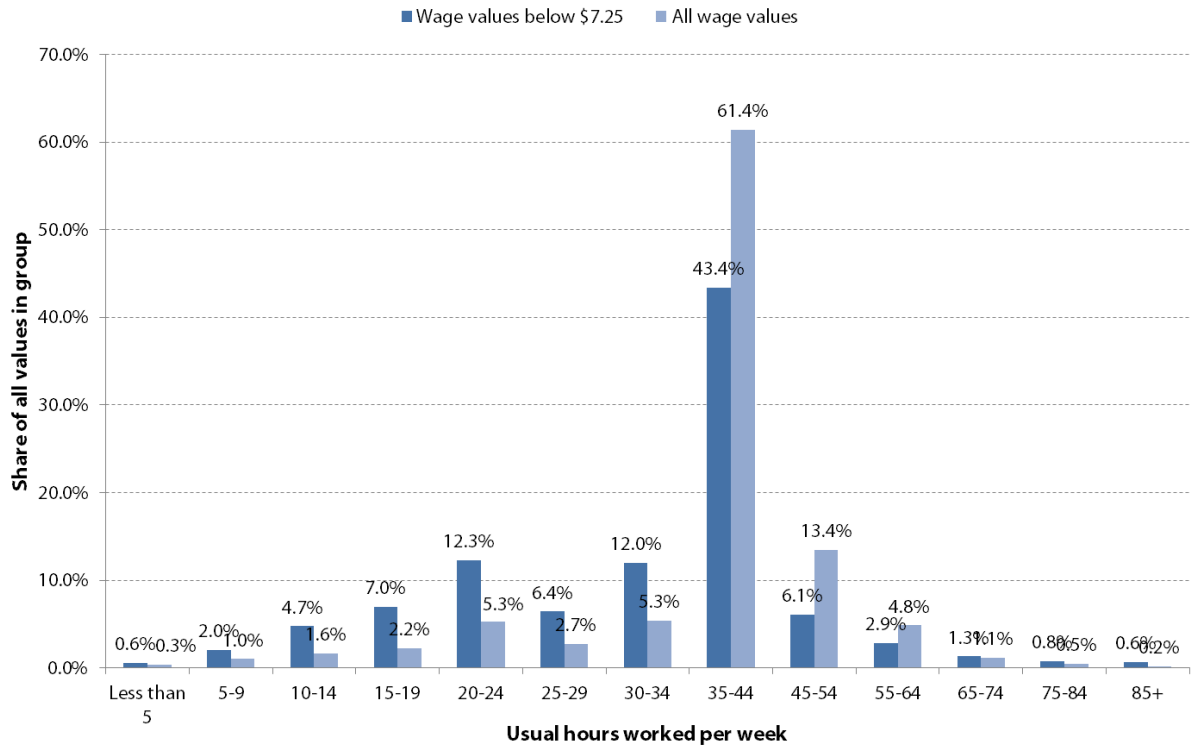
Table 5. Effect of increasing wages on incidence of receipt and value of public assistance benefits for workers likely affected by a minimum wage increase

Model dependent variable	**Coefficient on real hourly wages**	**S.E.**	**P > |t|**	**Model N**	**Adj-R^2**
Incidence of:					
Any aid	-0.031***	0.002	0.000	27,849	0.252
Earned-Income Tax Credit (EITC)	-0.029***	0.002	0.000	27,849	0.274
Energy assitance (LIHEAP)	-0.006***	0.001	0.000	27,849	0.041
Food stamps (SNAP)	-0.014***	0.002	0.000	27,849	0.130
Housing (Section-8)	-0.004***	0.001	0.000	27,849	0.042
Medicaid	-0.007***	0.001	0.000	27,849	0.074
TANF / Cash assistance	-0.002***	0.001	0.000	27,849	0.027
WIC	-0.004***	0.001	0.001	27,849	0.093
Total benefit dollars from:					
All transfers	-123.9***	10.3	0.000	27,849	0.385
All transfers, except EITC	-65.9***	7.3	0.000	27,849	0.163
Earned-Income Tax Credit (EITC)	-58.0***	5.9	0.000	27,849	0.423
Energy assistance (LIHEAP)	-2.1***	0.4	0.000	27,849	0.030
Food stamps (SNAP)	-36.9***	4.8	0.000	27,849	0.160
Housing	-15.6***	3.8	0.000	27,849	0.039
TANF/Cash assistance	-8.2***	1.9	0.000	27,849	0.021
WIC	-3.1***	0.7	0.000	27,849	0.085

Note: Universe is wage-earners who worked in the previous year with wage values between $6.89 (95% of $7.25) and $11.50. Models include controls for age, age^2, age^3, sex, race, worked part-time at any point previous year, marital status, family size, presence of a disabled person in the household, number of children under 18, citizenship, metropolitan status, state, major industry, major occupation category

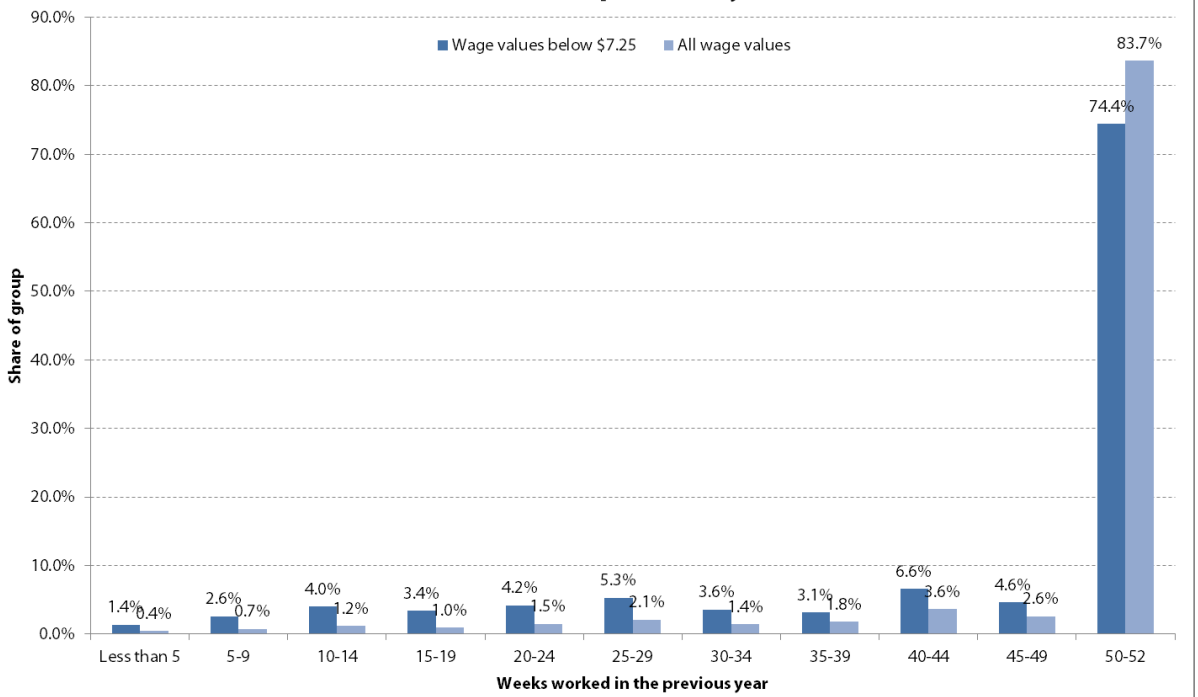
Source: Author's analysis of Current Population Survey, Annual Social and Economic Supplement microdata, pooled years 2011-2013

Appendix Figure AA. Distribution of imputed wage values below federal minimum wage and all imputed wage values



Source: Author's analysis of Current Population Survey, Annual Social and Economic Supplement microdata, pooled years 2011-2013

Appendix Figure AB. Distribution of imputed wage values below federal minimum wage and all imputed wage values, by weeks worked in the previous year



Source: Author's analysis of Current Population Survey, Annual Social and Economic Supplement microdata, pooled years 2011-2013

Appendix Table A1. Wage decile cutoffs (2012$)

10th percentile	20th percentile	30th percentile	40th percentile	Median	60th percentile	70th percentile	80th percentile	90th percentile
$ 7.63	$ 10.07	$ 12.49	$ 14.94	$ 17.70	$ 21.01	$ 25.25	$ 31.14	$ 42.09

Note: Universe includes all individuals age 16 or older who worked in the previous year and had imputed hourly wage values within the valid range.

Source: Author's analysis of Current Population Survey, Annual Social and Economic Supplement microdata, pooled years 2011-2013

Appendix Table A2. Occupations with largest shares of imputed wage values below the federal minimum wage

	Occupation	Share of occupation values that were below $7.25	Margin of error	Share of all values less than $7.25
1	Cashiers	30.9%	+/- 1.0%	9.1%
2	Waiters and waitresses	27.0%	+/- 1.2%	5.1%
3	Cooks	25.4%	+/- 1.2%	5.0%
4	Retail salespersons	18.1%	+/- 0.9%	4.8%
5	Janitors and building cleaners	15.2%	+/- 0.9%	3.3%
6	Maids and housekeeping cleaners	23.6%	+/- 1.4%	3.1%
7	Child care workers	30.4%	+/- 1.9%	2.5%
8	Food preparation workers	32.9%	+/- 2.0%	2.5%
9	Nursing, psychiatric, and home health aides	12.3%	+/- 0.9%	2.4%
10	Laborers and freight, stock, and material movers, hand	14.3%	+/- 1.0%	2.3%
11	Stock clerks and order fillers	16.3%	+/- 1.2%	2.2%
12	Personal and home care aides	21.7%	+/- 1.5%	2.2%
13	Teacher assistants	17.5%	+/- 1.4%	1.8%
14	Miscellaneous agricultural workers	24.4%	+/- 1.9%	1.7%
15	Driver/sales workers and truck drivers	6.1%	+/- 0.5%	1.6%
16	Customer service representatives	8.4%	+/- 0.8%	1.6%
17	Grounds maintenance workers	16.9%	+/- 1.6%	1.3%
18	First-line supervisors/managers of retail sales workers	5.4%	+/- 0.5%	1.3%
19	Receptionists and information clerks	9.9%	+/- 1.0%	1.2%
20	Secretaries and administrative assistants	4.2%	+/- 0.4%	1.2%
21	Elementary and middle school teachers	3.9%	+/- 0.4%	1.1%
22	Construction laborers	11.3%	+/- 1.2%	1.1%
23	Counter attendants, cafeteria, food concession, and coffee shop	44.5%	+/- 3.9%	1.0%
24	Dishwashers	33.6%	+/- 3.3%	1.0%
25	Combined food preparation & serving workers, including fast food	30.7%	+/- 3.1%	0.9%
26	Dining room and cafeteria attendants and bartender helpers	29.1%	+/- 3.0%	0.9%
27	Hosts and hostesses, restaurant, lounge, and coffee shop	40.0%	+/- 3.9%	0.9%
28	Packers and packagers, hand	20.0%	+/- 2.3%	0.8%
29	Hairdressers, hairstylists, and cosmetologists	16.3%	+/- 2.0%	0.8%
30	Security guards and gaming surveillance officers	8.9%	+/- 1.2%	0.7%

Source: Author's analysis of Current Population Survey, Annual Social and Economic Supplement microdata, pooled data years 2011-2013

Appendix Table A3. Occupations with highest incidence of imputed wage values below the federal minimum wage

	Occupation	Share of occupation values that were below $7.25	Margin of error	Share of all values less than $7.25
1	Counter attendants, cafeteria, food concession, and coffee shop	44.5%	+/- 3.9%	1.0%
2	Hosts and hostesses, restaurant, lounge, and coffee shop	40.0%	+/- 3.9%	0.9%
3	Dishwashers	33.6%	+/- 3.3%	1.0%
4	Food preparation workers	32.9%	+/- 2.0%	2.5%
5	Lifeguards, recreational and other protective service workers	32.0%	+/- 4.8%	0.4%
6	Cashiers	30.9%	+/- 1.0%	9.1%
7	Combined food preparation & serving workers, including fast food	30.7%	+/- 3.1%	0.9%
8	Child care workers	30.4%	+/- 1.9%	2.5%
9	Dining room and cafeteria attendants and bartender helpers	29.1%	+/- 3.0%	0.9%
10	Waiters and waitresses	27.0%	+/- 1.2%	5.1%
11	Food servers, nonrestaurant	25.9%	+/- 3.6%	0.5%
12	Cooks	25.4%	+/- 1.2%	5.0%
13	Miscellaneous agricultural workers	24.4%	+/- 1.9%	1.7%
14	Door-to-door sales workers, news and street vendors, and related workers	24.0%	+/- 5.2%	0.2%
15	Maids and housekeeping cleaners	23.6%	+/- 1.4%	3.1%
16	Nonfarm animal caretakers	22.9%	+/- 4.7%	0.3%
17	Miscellaneous entertainment attendants and related workers	22.3%	+/- 4.0%	0.3%
18	Personal and home care aides	21.7%	+/- 1.5%	2.2%
19	Hotel, motel, and resort desk clerks	20.2%	+/- 4.1%	0.3%
20	Cleaners of vehicles and equipment	20.1%	+/- 2.9%	0.5%
21	Packers and packagers, hand	20.0%	+/- 2.3%	0.8%
22	Miscellaneous personal appearance workers	19.3%	+/- 3.3%	0.4%
23	Bakers	19.2%	+/- 3.5%	0.3%
24	Bartenders	18.4%	+/- 2.4%	0.7%
25	Retail salespersons	18.1%	+/- 0.9%	4.8%
26	Teacher assistants	17.5%	+/- 1.4%	1.8%
27	Sewing machine operators	17.3%	+/- 3.6%	0.3%
28	Grounds maintenance workers	16.9%	+/- 1.6%	1.3%
29	Hairdressers, hairstylists, and cosmetologists	16.3%	+/- 2.0%	0.8%
30	Stock clerks and order fillers	16.3%	+/- 1.2%	2.2%

Source: Author's analysis of Current Population Survey, Annual Social and Economic Supplement microdata, pooled years 2011-2013

Appendix Table A4. Industries with largest shares of imputed wage values below the federal minimum wage

	Industry	Share of industry values that were below $7.25	Margin of error	Share of all values less than $7.25
1	Restaurants and other food services	27.5%	+/- 0.6%	20.1%
2	Elementary and secondary schools	6.2%	+/- 0.3%	5.4%
3	Grocery stores	18.7%	+/- 0.9%	4.7%
4	Construction	5.7%	+/- 0.3%	3.5%
5	Department stores and discount stores	14.9%	+/- 0.9%	3.0%
6	Colleges and universities, including junior colleges	7.0%	+/- 0.5%	2.5%
7	Child day care services	20.3%	+/- 1.4%	2.2%
8	Other amusement, gambling, & recreation industries	13.9%	+/- 1.0%	2.1%
9	Traveler accommodation	14.6%	+/- 1.1%	2.1%
10	Private households	29.5%	+/- 2.2%	1.8%
11	Services to buildings and dwellings	18.4%	+/- 1.5%	1.8%
12	Clothing and accessories, except shoe, stores	20.5%	+/- 1.6%	1.7%
13	Nursing care facilities	9.6%	+/- 0.8%	1.7%
14	Hospitals	2.5%	+/- 0.2%	1.5%
15	Individual and family services	10.6%	+/- 1.0%	1.5%
16	Home health care services	15.7%	+/- 1.4%	1.4%
17	Employment services	13.8%	+/- 1.4%	1.1%
18	Religious organizations	11.2%	+/- 1.2%	1.1%
19	Real estate	6.7%	+/- 0.7%	1.0%
20	Gasoline stations	23.9%	+/- 2.4%	1.0%

Source: Author's analysis of Current Population Survey Annual Social and Economic Supplement microdata, pooled data years 2011-2013

Appendix Table A5. Industries with highest incidence of imputed wage values below the federal minimum wage

	Industry	Share of industry values that were below $7.25	Margin of error	Share of all values less than $7.25
1	Recreational vehicle parks & camps, & rooming/boarding houses	31.0%	+/- 6.7%	0.2%
2	Private households	29.5%	+/- 2.2%	1.8%
3	Used merchandise stores	28.5%	+/- 4.4%	0.4%
4	Car washes	28.2%	+/- 5.1%	0.3%
5	Restaurants and other food services	27.5%	+/- 0.6%	20.1%
6	Shoe stores	24.1%	+/- 4.0%	0.4%
7	Gasoline stations	23.9%	+/- 2.4%	1.0%
8	Retail bakeries	23.7%	+/- 3.6%	0.5%
9	Animal production	22.6%	+/- 2.3%	1.0%
10	Drinking places, alcoholic beverages	21.1%	+/- 3.4%	0.4%
11	Clothing and accessories, except shoe, stores	20.5%	+/- 1.6%	1.7%
12	Child day care services	20.3%	+/- 1.4%	2.2%
13	Nail salons and other personal care services	19.8%	+/- 3.1%	0.5%
14	Specialty food stores	19.3%	+/- 3.2%	0.4%
15	Miscellaneous general merchandise stores	19.3%	+/- 2.2%	0.9%
16	Book stores and news dealers	19.2%	+/- 4.2%	0.2%
17	Grocery stores	18.7%	+/- 0.9%	4.7%
18	Services to buildings and dwellings	18.4%	+/- 1.5%	1.8%
19	Motion pictures and video industries	17.3%	+/- 2.8%	0.4%
20	Cut and sew apparel manufacturing	17.3%	+/- 3.3%	0.3%
21	Crop production	17.0%	+/- 1.9%	0.9%
22	Sporting goods, camera, & hobby and toy stores	16.7%	+/- 2.2%	0.7%
23	Home health care services	15.7%	+/- 1.4%	1.4%
24	Taxi and limousine service	15.7%	+/- 3.7%	0.2%
25	Beauty salons	15.6%	+/- 1.8%	0.9%
26	Miscellaneous retail stores	15.4%	+/- 2.3%	0.5%
27	Not specified retail trade	15.4%	+/- 3.4%	0.2%
28	Other personal services	15.1%	+/- 2.8%	0.3%
29	Hardware stores	14.9%	+/- 3.0%	0.3%
30	Department stores and discount stores	14.9%	+/- 0.9%	3.0%

Source: Author's analysis of Current Population Survey Annual Social and Economic Supplement microdata, pooled data years 2011-2013

Appendix Table C2. Receipt of means-tested government assistance by program and hourly wage decile

	Wage decile	All	Bottom 10th	2nd	3rd	4th	5th	6th	7th	8th	9th	Top 10th
	Total wage-earning population	122,195,870	12,055,494	11,930,504	12,490,933	11,961,794	12,121,782	12,653,629	12,316,954	11,976,098	12,468,785	12,219,898
Any government assistant	Count	28,326,932	6,535,609	5,382,504	4,519,389	3,437,618	2,870,682	2,096,057	1,285,593	864,336	743,728	591,416
	Incidence	23.2%	54.2%	45.1%	36.2%	28.7%	23.7%	16.6%	10.4%	7.2%	6.0%	4.8%
	Share of all recipients		23.1%	19.0%	16.0%	12.1%	10.1%	7.4%	4.5%	3.1%	2.6%	2.1%
	Total value of benefits	$ 67,551,564,175	$ 17,167,402,311	$ 15,866,231,563	$ 12,545,923,859	$ 8,292,433,118	$ 5,763,848,518	$ 3,300,980,434	$ 1,963,810,432	$ 1,160,058,769	$ 829,741,618	$ 661,133,553
	Share of all assistance		25.4%	23.5%	18.6%	12.3%	8.5%	4.9%	2.9%	1.7%	1.2%	1.0%
	Mean benefits received	$ 2,602	$ 2,759	$ 3,138	$ 2,978	$ 2,615	$ 2,186	$ 1,751	$ 1,788	$ 1,724	$ 1,444	$ 1,530
Earned-income tax credit (EITC)	Count	22,942,294	5,709,859	4,529,907	3,745,016	2,812,284	2,334,272	1,626,333	852,464	522,214	454,878	355,067
	Incidence	18.8%	47.4%	38.0%	30.0%	23.5%	19.3%	12.9%	6.9%	4.4%	3.6%	2.9%
	Share of EITC recipients		24.9%	19.7%	16.3%	12.3%	10.2%	7.1%	3.7%	2.3%	2.0%	1.5%
	Total value of benefits	$ 40,168,169,034	$ 8,783,430,855	$ 9,399,036,387	$ 8,070,119,262	$ 5,520,729,802	$ 3,751,178,220	$ 2,071,824,393	$ 1,077,981,564	$ 626,896,132	$ 483,492,857	$ 383,479,561
	Share of EITC benefits		21.9%	23.4%	20.1%	13.7%	9.3%	5.2%	2.7%	1.6%	1.2%	1.0%
	Mean benefits received	$ 1,751	$ 1,538	$ 2,075	$ 2,155	$ 1,963	$ 1,607	$ 1,274	$ 1,265	$ 1,200	$ 1,063	$ 1,080
Energy assistance (LIHEAP)	Count	1,746,805	498,577	436,446	291,994	199,222	127,856	87,716	48,471	23,569	18,353	14,602
	Incidence	1.4%	4.1%	3.7%	2.3%	1.7%	1.1%	0.7%	0.4%	0.2%	0.1%	0.1%
	Share of LIHEAP recipients		28.5%	25.0%	16.7%	11.4%	7.3%	5.0%	2.8%	1.3%	1.1%	0.8%
	Total value of benefits	$ 620,684,815	$ 172,899,501	$ 149,708,496	$ 102,550,748	$ 79,919,201	$ 45,878,847	$ 31,660,014	$ 16,808,200	$ 8,998,632	$ 6,059,499	$ 6,201,678
	Share of LIHEAP benefits		27.9%	24.1%	16.5%	12.9%	7.4%	5.1%	2.7%	1.4%	1.0%	1.0%
	Mean benefits received	$ 355	$ 347	$ 343	$ 351	$ 401	$ 359	$ 361	$ 347	$ 382	$ 330	$ 425
Food stamps (SNAP)	Count	7,804,465	2,147,893	1,782,577	1,327,782	887,317	596,462	420,603	272,970	169,872	112,817	86,171
	Incidence	6.4%	17.8%	14.9%	10.6%	7.4%	4.9%	3.3%	2.2%	1.4%	0.9%	0.7%
	Share of SNAP recipients		27.5%	22.8%	17.0%	11.4%	7.6%	5.4%	3.5%	2.2%	1.4%	1.1%
	Total value of benefits	$ 16,496,145,848	$ 4,899,000,721	$ 3,912,887,786	$ 2,752,453,602	$ 1,721,152,062	$ 1,209,882,111	$ 779,581,042	$ 522,490,117	$ 309,662,723	$ 215,783,337	$ 173,252,346
	Share of SNAP benefits		29.7%	23.7%	16.7%	10.4%	7.3%	4.7%	3.2%	1.9%	1.3%	1.1%
	Mean benefits received	$ 2,500	$ 2,660	$ 2,615	$ 2,468	$ 2,333	$ 2,363	$ 2,189	$ 2,236	$ 2,275	$ 2,346	$ 2,254
Housing assistance	Count	1,350,341	444,507	353,124	228,912	116,592	92,598	53,500	25,408	15,271	11,546	8,882
	Incidence	1.1%	3.7%	3.0%	1.8%	1.0%	0.8%	0.4%	0.2%	0.1%	0.1%	0.1%
	Share of housing assistance recipients		32.9%	26.2%	17.0%	8.6%	6.9%	4.0%	1.9%	1.1%	0.9%	0.7%
	Total value of benefits	$ 6,181,626,937	$ 2,254,668,907	$ 1,540,165,814	$ 1,023,504,740	$ 524,553,580	$ 376,091,979	$ 203,177,195	$ 121,396,969	$ 59,493,670	$ 42,630,307	$ 35,943,777
	Share of housing benefits		36.5%	24.9%	16.6%	8.5%	6.1%	3.3%	2.0%	1.0%	0.7%	0.6%
	Mean benefits received	$ 4,578	$ 5,072	$ 4,362	$ 4,471	$ 4,499	$ 4,062	$ 3,798	$ 4,778	$ 3,896	$ 3,692	$ 4,047
Medicaid	Count	5,961,691	1,443,576	1,200,942	898,214	597,004	485,943	378,302	291,602	240,526	217,867	207,716
	Incidence	4.9%	12.0%	10.1%	7.2%	5.0%	4.0%	3.0%	2.4%	2.0%	1.7%	1.7%
	Share of Medicaid beneficiaries		24.2%	20.1%	15.1%	10.0%	8.2%	6.3%	4.9%	4.0%	3.7%	3.5%
TANF / Cash assistance	Count	886,720	241,893	183,647	126,731	93,339	72,799	40,492	47,504	35,972	23,958	20,384
	Incidence	0.7%	2.0%	1.5%	1.0%	0.8%	0.6%	0.3%	0.4%	0.3%	0.2%	0.2%
	Share of TANF recipients		27.3%	20.7%	14.3%	10.5%	8.2%	4.6%	5.4%	4.1%	2.7%	2.3%
	Total value of benefits	$ 2,228,156,939	$ 621,488,927	$ 473,869,879	$ 299,094,767	$ 212,402,473	$ 202,274,543	$ 88,381,502	$ 131,961,563	$ 109,084,356	$ 50,453,287	$ 39,145,641
	Share of TANF benefits		27.9%	21.3%	13.4%	9.5%	9.1%	4.0%	5.9%	4.9%	2.3%	1.8%
	Mean benefits received	$ 2,513	$ 2,569	$ 2,580	$ 2,360	$ 2,276	$ 2,779	$ 2,183	$ 2,778	$ 3,032	$ 2,106	$ 1,920
Supplemental Nutrition for Women, Infants, and Children (WIC)	Count	3,578,889	846,652	740,817	584,781	441,559	338,037	237,588	176,052	91,112	74,866	47,424
	Incidence	2.9%	7.0%	6.2%	4.7%	3.7%	2.8%	1.9%	1.4%	0.8%	0.6%	0.4%
	Share of WIC recipients		23.7%	20.7%	16.3%	12.3%	9.4%	6.6%	4.9%	2.5%	2.1%	1.3%
	Total value of benefits	$ 1,856,780,602	$ 435,913,401	$ 390,563,200	$ 298,200,740	$ 233,676,000	$ 178,542,817	$ 126,356,288	$ 93,172,019	$ 45,923,256	$ 31,322,331	$ 23,110,550
	Share of WIC benefits		23.5%	21.0%	16.1%	12.6%	9.6%	6.8%	5.0%	2.5%	1.7%	1.2%
	Mean benefits received	$ 519	$ 515	$ 527	$ 510	$ 529	$ 528	$ 532	$ 529	$ 504	$ 418	$ 487

Note: All shares reflect shares of working recipients.

Source: Author's analysis of Current Population Survey, Annual Social and Economic Supplement microdata, pooled years 2011-2013

Appendix Table C3. Receipt of means-tested government assistance by program and major industry group

	Major industry	All	Agriculture, forestry, fishing, and hunting	Mining	Construction	Manufacturing	Wholesale and retail trade	Transportation and utilities	Information	Financial, insurance, real estate, and rental and leasing
	Wage-earning population	**122,195,870**	1,029,770	831,364	6,305,378	13,392,032	17,321,231	6,362,880	2,802,939	8,178,994
	Share		0.8%	0.7%	5.2%	11.0%	14.2%	5.2%	2.3%	6.7%
Any government assistant	**Count receiving benefits**	**28,326,932**	444,530	126,779	1,825,830	2,787,251	4,785,460	1,351,073	418,899	1,155,514
	Incidence	**23.2%**	43.2%	15.2%	29.0%	20.8%	27.6%	21.2%	14.9%	14.1%
	Share of all recipients		1.6%	0.4%	6.4%	9.8%	16.9%	4.8%	1.5%	4.1%
	Total value of benefits	**$67,551,564,175**	$1,265,738,402	$208,649,920	$4,720,611,175	$6,335,422,185	$11,472,479,613	$2,970,027,376	$767,658,383	$2,243,815,689
	Share of all assistance		1.9%	0.3%	7.0%	9.4%	17.0%	4.4%	1.1%	3.3%
	Mean benefits received	**$2,602**	$3,097	$1,857	$2,798	$2,447	$2,600	$2,447	$2,040	$2,169
Earned-income tax credit (EITC)	**Count receiving benefits**	**22,942,294**	379,994	97,686	1,500,752	2,271,434	3,874,223	1,048,306	325,607	914,365
	Incidence	**18.8%**	36.9%	11.8%	23.8%	17.0%	22.4%	16.5%	11.6%	11.2%
	Share of EITC recipients		1.7%	0.4%	6.5%	9.9%	16.9%	4.6%	1.4%	4.0%
	Total value of benefits	**$40,168,169,034**	$843,219,393	$156,633,409	$3,105,018,816	$4,094,678,793	$6,515,520,733	$1,808,816,564	$470,757,720	$1,506,098,677
	Share of EITC benefits		2.1%	0.4%	7.7%	10.2%	16.2%	4.5%	1.2%	3.7%
	Mean benefits received	**$1,751**	$2,219	$1,603	$2,069	$1,803	$1,682	$1,725	$1,446	$1,647
Energy assistance (LIHEAP)	**Count receiving benefits**	**1,746,805**	37,642	4,419	77,076	162,992	307,958	71,826	27,631	46,951
	Incidence	**1.4%**	3.7%	0.5%	1.2%	1.2%	1.8%	1.1%	1.0%	0.6%
	Share of LIHEAP recipients		2.2%	0.3%	4.4%	9.3%	17.6%	4.1%	1.6%	2.7%
	Total value of benefits	**$620,684,815**	$10,694,552	$1,656,653	$28,690,327	$54,635,426	$103,966,934	$27,822,246	$8,962,278	$17,803,813
	Share of LIHEAP benefits		1.7%	0.3%	4.6%	8.8%	16.8%	4.5%	1.4%	2.9%
	Mean benefits received	**$355**	$284	$375	$372	$335	$338	$387	$324	$379
Food stamps (SNAP)	**Count receiving benefits**	**7,804,465**	131,137	21,594	516,693	758,760	1,346,433	356,904	91,359	227,361
	Incidence	**6.4%**	12.7%	2.6%	8.2%	5.7%	7.8%	5.6%	3.3%	2.8%
	Share of SNAP recipients		1.7%	0.3%	6.6%	9.7%	17.3%	4.6%	1.2%	2.9%
	Total value of benefits	**$16,496,145,848**	$277,406,734	$35,735,548	$1,158,053,966	$1,489,465,907	$2,877,291,671	$750,972,610	$185,719,787	$439,318,140
	Share of SNAP benefits		1.7%	0.2%	7.0%	9.0%	17.4%	4.6%	1.1%	2.7%
	Mean benefits received	**$2,500**	$2,516	$2,320	$2,692	$2,391	$2,523	$2,548	$2,308	$2,264
Housing assistance	**Count receiving benefits**	**1,350,341**	9,738	387	33,310	73,136	269,185	48,090	14,175	41,207
	Incidence	**1.1%**	0.9%	0.0%	0.5%	0.5%	1.6%	0.8%	0.5%	0.5%
	Share of housing assistance recipients		0.7%	0.0%	2.5%	5.4%	19.9%	3.6%	1.0%	3.1%
	Total value of benefits	**$6,181,626,937**	$39,801,179	$1,395,184	$138,140,407	$320,201,041	$1,266,686,112	$207,982,940	$55,069,836	$171,818,684
	Share of housing benefits		0.6%	0.0%	2.2%	5.2%	20.5%	3.4%	0.9%	2.8%
	Mean benefits received	**$4,578**	$4,087	$3,602	$4,147	$4,378	$4,706	$4,325	$3,885	$4,170
Medicaid	**Count receiving benefits**	**5,961,691**	82,840	19,045	272,262	446,896	1,040,685	277,665	90,294	220,228
	Incidence	**4.9%**	8.0%	2.3%	4.3%	3.3%	6.0%	4.4%	3.2%	2.7%
	Share of Medicaid beneficiaries		1.4%	0.3%	4.6%	7.5%	17.5%	4.7%	1.5%	3.7%
TANF / Cash assistance	**Count receiving benefits**	**886,720**	15,295	2,221	41,736	71,987	167,322	36,325	12,238	28,662
	Incidence	**0.7%**	1.5%	0.3%	0.7%	0.5%	1.0%	0.6%	0.4%	0.4%
	Share of TANF recipients		1.7%	0.3%	4.7%	8.1%	18.9%	4.1%	1.4%	3.2%
	Total value of benefits	**$2,228,156,939**	$52,898,072	$6,662,388	$130,128,262	$161,402,305	$403,124,779	$89,594,054	$25,015,097	$48,899,279
	Share of TANF benefits		2.4%	0.3%	5.8%	7.2%	18.1%	4.0%	1.1%	2.2%
	Mean benefits received	**$2,513**	$3,458	$3,000	$3,118	$2,242	$2,409	$2,466	$2,044	$1,706
Supplemental Nutrition for Women, Infants, and Children (WIC)	**Count receiving benefits**	**3,578,889**	78,881	11,494	294,890	410,715	595,260	156,518	45,577	115,271
	Incidence	**2.9%**	7.7%	1.4%	4.7%	3.1%	3.4%	2.5%	1.6%	1.4%
	Share of WIC recipients		2.2%	0.3%	8.2%	11.5%	16.6%	4.4%	1.3%	3.2%
	Total value of benefits	**$1,856,780,602**	$41,718,473	$6,566,738	$160,579,398	$215,038,712	$305,889,382	$84,838,961	$22,133,665	$59,877,095
	Share of WIC benefits		2.2%	0.4%	8.6%	11.6%	16.5%	4.6%	1.2%	3.2%
	Mean benefits received	**$519**	$529	$571	$545	$524	$514	$542	$486	$519

Note: All shares reflect shares of working recipients.

Source: Author's analysis of Current Population Survey, Annual Social and Economic Supplement microdata, pooled years 2011-2013

Appendix Table C3. Receipt of means-tested government assistance by program and major industry group (continued)

	Major industry	All	Professional, scientific, management, administrative, and waste management services	Educational, health, and social services	Arts, entertainment, recreation, accommodation, and food services	Other services (except public administration)	Public administration	Armed Forces and active duty military
	Wage-earning population	**122,195,870**	12,320,889	30,173,386	11,358,352	5,360,823	6,696,268	61,564
	Share		10.1%	24.7%	9.3%	4.4%	5.5%	0.1%
Any government assistant	**Count receiving benefits**	**28,326,932**	2,565,846	6,012,856	4,366,121	1,626,330	846,537	13,905
	Incidence	**23.2%**	20.8%	19.9%	38.4%	30.3%	12.6%	22.6%
	Share of all recipients		9.1%	21.2%	15.4%	5.7%	3.0%	0.0%
	Total value of benefits	**$67,551,564,175**	$5,840,977,954	$15,118,814,773	$11,071,168,656	$3,944,439,649	$1,570,910,484	$20,849,914
	Share of all assistance		8.6%	22.4%	16.4%	5.8%	2.3%	0.0%
	Mean benefits received	**$2,602**	$2,494	$2,759	$2,743	$2,615	$2,100	$1,499
Earned-income tax credit (EITC)	**Count receiving benefits**	**22,942,294**	2,078,090	4,798,701	3,607,778	1,368,955	664,227	12,178
	Incidence	**18.8%**	16.9%	15.9%	31.8%	25.5%	9.9%	19.8%
	Share of EITC recipients		9.1%	20.9%	15.7%	6.0%	2.9%	0.1%
	Total value of benefits	**$40,168,169,034**	$3,452,133,740	$8,548,474,068	$6,259,284,241	$2,383,726,937	$1,008,451,794	$15,354,148
	Share of EITC benefits		8.6%	21.3%	15.6%	5.9%	2.5%	0.0%
	Mean benefits received	**$1,751**	$1,661	$1,781	$1,735	$1,741	$1,518	$1,261
Energy assistance (LIHEAP)	**Count receiving benefits**	**1,746,805**	143,865	428,932	297,464	101,348	38,700	-
	Incidence	**1.4%**	1.2%	1.4%	2.6%	1.9%	0.6%	0.0%
	Share of LIHEAP recipients		8.2%	24.6%	17.0%	5.8%	2.2%	0.0%
	Total value of benefits	**$620,684,815**	$52,237,756	$158,742,236	$106,042,752	$33,507,549	$15,922,293	
	Share of LIHEAP benefits		8.4%	25.6%	17.1%	5.4%	2.6%	0.0%
	Mean benefits received	**$355**	$363	$370	$356	$331	$411	
Food stamps (SNAP)	**Count receiving benefits**	**7,804,465**	729,000	1,660,329	1,358,505	427,919	176,885	1,584
	Incidence	**6.4%**	5.9%	5.5%	12.0%	8.0%	2.6%	2.6%
	Share of SNAP recipients		9.3%	21.3%	17.4%	5.5%	2.3%	0.0%
	Total value of benefits	**$16,496,145,848**	$1,456,575,762	$3,614,994,173	$2,922,477,681	$943,443,606	$340,975,760	$3,714,504
	Share of SNAP benefits		8.8%	21.9%	17.7%	5.7%	2.1%	0.0%
	Mean benefits received	**$2,500**	$2,388	$2,479	$2,588	$2,599	$2,309	$2,344
Housing assistance	**Count receiving benefits**	**1,350,341**	107,668	397,307	250,699	69,260	35,498	680
	Incidence	**1.1%**	0.9%	1.3%	2.2%	1.3%	0.5%	1.1%
	Share of housing assistance recipients		8.0%	29.4%	18.6%	5.1%	2.6%	0.1%
	Total value of benefits	**$6,181,626,937**	$513,570,055	$1,828,227,944	$1,156,839,639	$371,431,003	$110,356,115	$106,799
	Share of housing benefits		8.3%	29.6%	18.7%	6.0%	1.8%	0.0%
	Mean benefits received	**$4,578**	$4,770	$4,602	$4,614	$5,363	$3,109	$157
Medicaid	**Count receiving benefits**	**5,961,691**	541,134	1,388,734	1,083,955	339,802	157,686	465
	Incidence	**4.9%**	4.4%	4.6%	9.5%	6.3%	2.4%	0.8%
	Share of Medicaid beneficiaries		9.1%	23.3%	18.2%	5.7%	2.6%	0.0%
TANF / Cash assistance	**Count receiving benefits**	**886,720**	77,526	225,295	137,427	46,043	24,308	335
	Incidence	**0.7%**	0.6%	0.7%	1.2%	0.9%	0.4%	0.5%
	Share of TANF recipients		8.7%	25.4%	15.5%	5.2%	2.7%	0.0%
	Total value of benefits	**$2,228,156,939**	$194,405,149	$621,676,022	$321,226,507	$115,809,191	$56,973,336	$342,497
	Share of TANF benefits		8.7%	27.9%	14.4%	5.2%	2.6%	0.0%
	Mean benefits received	**$2,513**	$2,508	$2,759	$2,337	$2,515	$2,344	$1,023
Supplemental Nutrition for Women, Infants, and Children (WIC)	**Count receiving benefits**	**3,578,889**	344,178	665,078	593,840	193,658	70,485	3,044
	Incidence	**2.9%**	2.8%	2.2%	5.2%	3.6%	1.1%	4.9%
	Share of WIC recipients		9.6%	18.6%	16.6%	5.4%	2.0%	0.1%
	Total value of benefits	**$1,856,780,602**	$172,055,493	$346,700,330	$305,297,836	$96,521,364	$38,231,188	$1,331,966
	Share of WIC benefits		9.3%	18.7%	16.4%	5.2%	2.1%	0.1%
	Mean benefits received	**$519**	$500	$521	$514	$498	$542	$438

Note: All shares reflect shares of working recipients.

Source: Author's analysis of Current Population Survey, Annual Social and Economic Supplement microdata, pooled years 2011-2013

Appendix Table C4. Estimated workers affected by a minimum wage increase to $10.10 and average increase in wages for affected workers

	Wage earning population	Directly affected	Indirectly affected	Total affected	Share of wage-earning population
Total	132,424,042	15,583,893	11,533,834	27,117,727	20.5%
Average raise in hourly wage as a result of MW increase				$1.61	
Average total nominal change in hourly wage value (natural wage growth / inflation)				$2.04	
Total wage increase for all affected workers				$31,812,645,991	

Source: Author's analysis of Current Population Survey, outgoing rotation group microdata, 2013

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[i] CBO (2014), p. 3.

[ii] Future iterations of this paper will attempt to correct for the documented undercount.

[iii] This report does not include any data on participation or costs in the National School Lunch Program, the only other large national means-tested public assistance program.

[iv] Wage decile information is presented in Appendix Table A1.

[v] Note that throughout this report, Medicaid is included for all calculations of participation in assistance programs; however, I do not include the fungible value of Medicare benefits in any estimates of program costs or value of benefits.

[vi] This finding is consistent with Shierholz (2014) who finds particularly high poverty rates among restaurant workers and Allegretto, et al. (2014) who estimated that more than half of full time fast food workers were enrolled in some public assistance program.

[vii] For workers in these first two wage groups, I use a lower bound on hourly wages of $6.89 (95 percent of $7.25) in order to compensate for clustering in the CPS data and error introduced by the hourly wage imputation process that may have artificially imputed hourly wages just below the federal minimum.

[viii] See Wicks-Lim (2005) or Neumark, Schweitzer, and Washer (2004) for a summary of research on spillover effects.

[ix] Note that this estimate of affected workers from the CPS ORG data is larger than the count of workers with imputed wages in the range of $6.89 to $11.50 from the CPS-ASEC data used in this study. Because the ORG data is thought to be the more robust measure of hourly wages, this is likely to be a more accurate count of the population likely to be affected from a minimum wage increase to $10.10.

[x] This simulation utilizes the same model employed in Cooper (2013) , updated to reflect newly legislated changes in state minimum wage laws that occurred after the analysis in that report.

[xi] See also Greenhouse (2014).

[xii] These data are from 2010-2012. Home health care workers and aids were brought under the FLSA in 2014; however, farm workers on small farms remain exempt from the FLSA's wage protections.

[xiii] Author's analysis of American Community Survey microdata, pooled sample 2007–2011. Data compiled by Ruggles, et al. (2010).